United States Court of Appeals

for the Second Circuit

APPENDIX

ORIGINAL

75-7441

United States Court of Appeals
For the Second Circuit

AMERICAN SMELTING & REFINING COMPANY,
Plaintiff,

against

S.S. IRISH SPRUCE, her engines, tackle, etc.,
Defendant,

against

IRISH SHIPPING LTD.,
Defendant-Appellant.

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability,

COMPANIA PERUANA DE VAPORES, S.A.,
Claimant-Appellant.

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF NEW YORK

JOINT APPENDIX

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SECOND CIRCUIT

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DEPOSITION OF FRANCIS EDWARD HEALY

Second Officer of the "Irish Spruce" (Ex. 64)

End 4

[redacted]

of

[redacted]

and

[redacted]

in the matter of

s.s. "IRISH SPRUCE" - Stranding on Outa Sueno Bank.

Thursday, 20th January, 1972.

held at

the officer of IRISH SHIPPING LTD.,
19/21 Aston Quay, Dublin 2,
Ireland.

on

Friday, 21st April, 1972.

(From the Shorthand Notes of:
[redacted]
39 Victoria Str eet,
Westminster, [redacted] 1.)

FRANCIS EDWARD HEALY, having been first duly sworn, testified as follows:

EXAMINED BY
MR. BUCKLEY:

Q. Mr Healy, is it a fact that you were an officer on board the IRISH SPRUCE when she stranded? A. Yes, that is correct.

Q. What is your full name? A. Francis Edward Healy.

Q. And what is your address? A. Greenways, Ballintemple, Blackrock Road, Cork.

Q. By whom were you employed when aboard the IRISH SPRUCE? A. Irish Shipping Limited.

Q. Do you have any licence? A. Yes, Sir, I do.

Q. What is the grade of that licence? A. First Mate Foreign Going.

Q. Who issued that licence? A. It is issued by the Department of Transport and Power.

Q. Of the Republic of Ireland? A. Yes.

Q. How long have you had your Chief Mate's Licence? A. Since July, 1970.

Q. How long before that had you any other licence, and what was the licence? A. That was the Second Mate Foreign Going. I obtained that in January, 1969.

Q. And had you been to sea before that? A. Yes, I began as an apprentice of this company on 13th November, 1964.

Q. What was your schooling in respect of fitting you to go to sea? A. Mid-way through apprenticeship I spent six months in the Nautical College at Plymouth.

Q. Where? A. At the Nautical College at Plymouth in England.

Q. What was your schooling before you began going to sea? A. I went up as far as what we call Leaving Certificate in secondary school.

Q. How long have you been sailing as ship's officer - ever since you got a second mate's licence? A. Yes.

Q. When did you join the IRISH SPRUCE? A. This time I joined the IRISH SPRUCE on 10th June, 1971. I had been on her for some months or somet in like some date in November, 1970, up to some date in January, 1971.

Q. I take it you joined the same time as Captain Kerr the second time? A. No, Sir. I was there before.

Q. As the second officer of that vessel what were your duties? A. The watch I kept at sea was from midnight to four in the morning and from midday to four in the afternoon.

Q. And what were your duties generally aboard the vessel? A. My duties were as regards all charts and nautical publications, etc.

Q. Were you the one who, at our request through the owners, gathered all the navigating documents and so on to be shipped back here? A. Yes, most of them I packed in the box.

Q. I will show you these current charts and ask you if you gathered these together. Here are four. I was wondering why only four were included - if you could tell me? A. I do not recall the actual number of these that I actually packed in the box.

Q. How many did you put together to be packed in the box? A. I do not recall how many. I am surprised there are only four.

Q. In other words, there were more than four which you gathered together to be sent back. Is that right? A. I am not saying that.

Q. Would you tell me what you mean then? A. As I remember rightly Captain Raftery asked me to gether some of these pilot charts and put them in the box. What I laid out on the chart table was a whole stack of these going back over a number of years. I do not know how many of them there were, there were numerous charts there, and he said, "We will take just some of the more recent ones; some of the ones that apply, as near as we can, to the months in question." For instance, stranding took place in January. There is January, 1970. There is January, 1971. There is the latest one we had aboard which is December, 1971. There is February, 1970, which is the other side, the month after grounding.

Q. You have handed in another current chart? A. That is correct, Sir.

Q. And I ask you where you obtained that from? A. This is brought back from the ship myself.

Q. Did you have a set of them yourself aboard the ship? A. No, I did not have a personal set myself but this particular one happens to be duplicated and when leaving I thought, out of interest, I would bring this one home for myself.

Q. Because of the grounding on the sand bank? A. Yes, because of the grounding on the sand bank and also it is fairly recent. It is November, 1972.

Q. You may have the four marked as a separate exhibit WW1, 2, 3, 4. (Document was so marked.) Who is Captain Raftery? A. He is the Deck Superintendent of this company.

Q. He was aboard the ship after the stranding? A. After the stranding he boarded the vessel.

Q. Mr Healy, I show you Irish exhibit ZZ, the photograph previously identified by the Captain and you will note in this picture a ship on the horizon. Do you see that? A. Yes.

Q. Is that this wreck? A. That one, no. I think Brookfield or Bloomfield is her name. She is a Western New York. C.2, and that photograph on that is different.

Q. Had you read this article prior to your stranding? A. Yes, I had.

Q. Did you keep a private journal A. Yes, Sir, I do.

Q. Have you got it with you? A. Yes, Sir, I have.

Q. Would you produce if for me. (The same was produced) You showed me where there was a notation, a reference to this article, in your personal jotting diary. Could you show it to me again? Let the record show that the current chart that was brought back by Mr Healy has been marked Irish exhibit YY. A. That is the notation there.

Q. It is undated, but can you tell me approximately what the date should be? A. The chart itself is for November, 1971, so it is somewhere between then and the grounding. I would think it is somewhere during the month of December. The note there actually refers to North Pacific, 1971, but the same article is on North Atlantic for 1971.

Q. Mr Healy, I do not see any summaries or references to the last voyage of the IRISH SPRUCE. Can you tell me about that, why there are not any? A. The last date in that is December, 24th.

Q. That is right. A. I did not write it up after that. The following day was Christmas Day and I did not feel like writing it up that day, and I never got round to carrying it on.

Q. Did you make any notes of any sort of events on that voyage? How did you make up your personal journal ordinarily? A. Usually I looked back in the ship's log book and things I remembered myself.

MR BAILLIE: We will have a photostat copy of that page made, the one to which you have been referring, and make the photograph ZZ.

Mr JACOBSEN: I would request a copy of the whole book, and if the whole book is copied let it be marked.

Mr BAILLIE: Would you explain why? Mr Jacobsen, there is no reference to anything connected with this case at any earlier voyage.

Mr JACOBSEN: I will hold it for the time being, and after cross-examination I will answer your question.

Mr BAILLIE: Would you mind if we had the whole book copied? A. No. It is all right by me.

Mr BAILLIE: We will have the whole book copied, and that will be marked exhibit ZZ. The Notice to Mariners with which we have been furnished, and which is marked Irish exhibit H, I wonder if you could tell me about the gathering of the Notices to Mariners togethr to be shipped back here, and why, if you can tell me, they are limited to just this number? A. The Captain, that is Captain Kerr, asked me to gather together the Notices to Mariners. I laid these out on the chart room table, and there were a hell of a lot of them there. They were going back a couple of years. In consultation with him we decided this only was the number to be put in the boxes.

Q. Did you have a complete set of Notices to Mariners? How far back? A. This was the latest one we had, number 50. How far back they went - I think there was about two years there, may be even more.

Q. Why are some British Admiralty Notices and some American Notices? A. The British Admiralty Notices are sent out by the Company. The American Notices which were brought aboard by somebody, and by somebody I mean the ship was visited by Members of the U.S. Coast Guard in some U.S. port or the National Weather Service or something like that, some such body ....

Q. What is this group of papers or notations? A. This group of papers is what we call the noon slips.

Q. What was the purpose of that? A. The purpose of this is for the deck department to inform the engine department and vice versa. For instance, at noon I fill in this section here, latitude, longtitude, course, distance, steaming time and average speed, and I hand this to the Chief Engineer. The Chief Engineer then fills in there headings on his log book

for the noon position. He takes the information from this, and he then fills in fuel consumption for the last 24 hours, fuel remaining, revolutions per minute, distance planned, and that information I put in the deck log. The function of these slips is to inter-change information between departments.

Q. The last one there is dated 26th January? A. That is correct, sir.

Q. That indicates your noon position on the 26th? A. 11°13' North, 79°28' West.

Q. Could we have this file marked as the next exhibit? Now, you had a course recorder aboard the vessel, is that right? A. That is right, Sir.

Q. Did you extract the reel of paper from the course recorder? A. I do not recall doing that, Sir, no.

Q. Really, I thought you did? A. No, I recall packing it in the box, yes, but not actually physically removing it from the recorder.

Q. Could you testify whether or not this came from your course recorder, the course recorder aboard the vessel? A. That is the course recording paper from the ship.

Q. Is there any coordinating at any time of the times of the course recorder with the actual time? Do you do that at any set period of the day? A. Not at any set period of the day, Sir, no.

Q. Could you tell me whether or not the time on this course recorder was out with the clocks? A. With the actual time - yes, Sir, it was out.

Q. Can you tell me how much? A. It is over an hour out on that. This here is the alteration at midnight. The reading there is about 10.50 or so.

Q. As much as an hour and ten minutes out then? A. Yes, as much as an hour and ten minutes out.

Q. What was the change at midnight, as indicated by the course recorder record? A. I do not quite follow you, Sir.

Q. What was the change in course? A. The change of course, you mean, according to this?

Q. Yes. A. These are divided into sections.

Q. During the last department, there? A. This one here. It is about 331 by the look of it there on that. That was the previous, and then -

I beg your pardon, Sir, but I am reading it the wrong way. That is 301 there and it is, it looks like, 301 approximately.

Q. I better mark this. The record from the course recorder has been marked Irish exhibit EEE. Could I show you this book and ask you what that is? (Document handed to witness) A. That is my sight book, in other words, my work book. It is my own personal property.

Q. And what do you put in that book? A. The only thing I put in that is the calculations of sights.

Q. Your personal calculations? A. Yes.

Q. Aboard the ship did you do all the calculations of the sun lines and so on of position and such like? A. The normal practice was that I took a sun line in the morning; the Third Mate also took one in the morning.

MR JACOBSEN: Objection to the answer. I believe it is responsive. You asked him if he did all the sights. A. I was not the one who solely did sights aboard the ship.

MR BAILLIE: But all the writing in this book is yours? A. All the writing in that book is mine.

Q. If at times the Third Mate made some of the computations would he have a separate book? A. He would have a separate book.

Q. You do not know whether he has his or not? A. I do not know.

Q. I have here a sketch and I ask you what that is? (Document handed to witness) A. That is a copy of a radar plot, the plot of the echo of the other wreck stranded on Quita Sueno. The actual plot was done on the surface of the radar screen itself with a chinagraph pencil, a grease pencil.

Q. Andyou made it? A. I made it.

Q. We will return to this later. Did you make this sketch also? (Document handed to witness) A. Yes, Sir. I also made that sketch.

Q. What does that show, Mr Healy? A. This is a sketch showing the light of the reef; the position of the vessel on the reef, and there are contour lines. These, the figures of the contour lines, I got from the salvage company who has actually taken these soundings.

MR JACOBSEN: Where do you say the light was, or about where? A. The light is not on this sketch. The scale of this is much too small to show

that.

MR BAILLIE: Indication far to the North? A. Oh, yes, to the North.

MR JACOBSEN: Now I ask where the wreck is that is referred to? A. Again the scale is such that it is.....

Q. Further North? A. Further North.

MR BAILLIE: I show you this duplication of a chart and ask you whether or not you prepared that, Mr Healy? (Document handed to witness) A. Yes, Sir. I made this.

Q. What was the purpose of that? A. This was sent to the Company, not in the box with the rest of the documents. It was sent to the Company earlier on and Captain Raftery asked me to make a reproduction like this for the purpose of informing the Company.

Q. It is an enlargement? A. It is twice the scale of the '70 chart, 1218.

Q. You made that while you were still aboard the ship, is that right? A. I made that while I was still aboard the ship.

MR JACOBSEN: After the stranding? A. After the stranding.

MR BAILLIE: May it be marked? The sketch slowing the vessel on the strand made by Mr Healy has been marked Irish exhibit EEE. The enlargement of an area of the British Admiralty chart prepared by Mr Healy has been marked Irish exhibit FFF (continental 'F'). Prior to leaving the canal zone, did you plot a course that the ship was going to follow? A. Yes, Sir, I did.

Q. Did you do it under the Captain's direction? A. Yes, Sir.

Q. I show you this chart which has been previously marked Irish exhibit C, Mr Healy. Is that the one you plotted course on? A. Yes, Sir, that is correct.

Q. And would you indicate for the record what course it was you plotted first, the first one you made? A. Yes, the first course was from Panama 357° to this point here off Roncador Bank.

Q. And then on to the other line? A. And then on to 323° and so on.

Q. Were you aboard the vessel when she made that trip before? A. The previous trip, yes, Sir.

Q. Was that the same course that you had followed then? A. Almost - this first leg was.

Q. In other words, the course of 339° was the one you laid out before? A. Before.

Q. What differed in the subsequent course? A. In the subsequent course we went nearer to Bermuda Isle.

Q. How was it planned then, if there is a reason? A. On the previous voyage we failed to pick up the light on Bermuda and failed to get a radar return from Bermuda Isle, and this time we said, "Well, it failed the previous voyage so...".

Q. So what? A. So we decided to come from Ronaldor across to the North.

Q. To pick up that light? A. To pick up that light.

Q. That chart also indicates a change. Could you tell us about that and why the change was made, if you were instrumental on the bridge when the change was made, were you? A. Yes. There were a number of changes made. These were due to the weather conditions.

Q. And what did the weather conditions have to do with the change? A. The sea and swell increased after sailing from Panama. The speed was reduced because the vessel was making heavy weather of it, and later on the course was changed because she was rolling very heavily; the course was changed to bring the sea more favourably.

Q. Did you make changes to course 396° in this chart too, which has previously been marked Irish exhibit E? A. Yes, Sir, that is correct.

Q. You made the changes indicated on that? A. Yes, I did.

Q. Did you have a large scale chart for the distance between your 12 noon position and on to the position as picked up on chart number 1210, which has previously been marked Irish exhibit F? A. It should be on this chart here.

Q. On the bigger one? A. On the bigger one.

Q. But there is no intervening one? A. No, Sir. There is no intervening one.

Q. There is a position indicated there on the chart that you have before you, Irish exhibit E, and it is also indicated on Irish exhibit C, at 12 noon on the 26th, is that right? A. Yes, 12 noon is here, Sir.

Q. Did you have anything to do with determining that position? A. Yes, I did, Sir.

Q. How did you go about obtaining that position? A. I took a sun line in the morning, at around 10 o'clock, and at noon I took the latitude.

Q. Are your calculations in respect of latitude in this book which has been marked exhibit 33? A. Yes, they are.

Q. Do they appear on this page? A. Yes, they are on this page, in this column here.

Q. Pointing to the page, dav 26th January, 1972, at the top, Christobal to Panama Canal, is that right? A. Yes, that is correct, Sir.

Q. Was that the last calculation you make prior to the stranding? A. Yes, Sir, it was.

Q. How sure are you of the correctness of that position? A. I am quite confident of it.

Q. You were on the 12 to 4 watch. Was there anything unusual happened between the 12 noon to 4 watch on the 26th? A. Nothing unusual, no, Sir.

Q. What were the weather conditions? A. Could I refer to the log book?

Q. I would rather have your recollection? A. If I remember it was something like force 4 or 5, North-easterly, moderate to tough sea, heavy swell.

Q. How about the over-cast, any? A. Yes, I think it was partly overcast.

Q. And thereafter did you go below or stay around the deck, after that watch? A. After that watch I went below.

Q. When did you next come on watch? A. I next came on watch at midnight.

Q. Where was the vessel at that time, if you know? A. I expected she would be to the Westwards of Roncador at that time.

Q. Are the course lines on this chart, previously marked Irish exhibit F, your marks? A. Yes, they are.

Q. How about that dash line, is that yours? A. The dash line, no, that is ot mine.

Q. Tell us what happened when you came on watch? Did you ever pick up Roncador Light? A. No, Sir. We had expected to see Roncador Light at about 23.00. When I came on watch at midnight Roncador Light had not been sighted and no echo from Roncador Bank had been received.

Q. You mean the echo on the radar? A. The echo on the radar. The course had been changed at midnight to 323° true.

Q. Did you keep on that same path when you passed the light on the previous voyage? A. Yes, I did.

Q. Can you recall without looking at the log whether or not you sighted Roncador Light on that voyage? A. Yes, we did sight it on that voyage.

Q. How far off was it on that voyage, when you passed it? A. When we passed it, 11 miles as I recall.

Q. What was that, a visual sighting or radar sighting? A. Both.

MR JACOBSEN: May I ask if the range was taken visually? A. I beg your pardon?

MR BAILLIE: Was the distance determined visually? A. No, Sir, by radar.

Q. I notice that in the log book there are two distances which are marked - 00.30 hours and 00.45 hours - the two distances? A. Yes, what is the question?

Q. Do you have any recollection of determining those distances? A. I recollect the 11 miles one, yes; the 16 miles one I am not so sure about.

MR BAILLIE: We have been referring to Irish exhibits SS and SS1

MR JACOBSEN: The deck logs.

MR BAILLIE: The deck logs of the IRISH CYPRESS for August 29th/30th, 1971. When you did not pick up that light at the time you expected to pick it up, what did you do? The Captain was on the bridge at that time, was he? A. Yes, Sir. The Captain was on the bridge at that time.

Q. What did the two of you decide to do? A. The course had already been altered. I had had a long discussion with the Captain, looking at the chart. I realised that the Captain had let the vessel continue on her original course for an hour. In other words, we had expected to be Westward of the Light on Roncador at 23.00, that is, at the point where the course would be altered. The vessel was not altered at 23.00. She was allowed on the original course until midnight.

Q. Did you ever see the light thereafter? A. On Roncador, no.

MR JACOBSEN: I would appreciate it if you would state that course.

MR BAILLIE: Yes, state that course. What course were you on? A. This was the 330° course, the original course.

Q. I see. At 24.00 it was changed to what? A. At midnight, 24.00, it was changed to 323°.

... Which course would take you further to the west ... This course would take it farther to the west.

... And you still had not picked up the Roncador Light? ... We still had not picked up the Roncador Light.

... Did you at any time - you had direction finder equipment aboard the ship, did you? ... Yes, Sir, we did.

... Did you at any time attempt to use the direction finder? ... I switched it on somewhere between midnight and half past midnight.

... Did you attempt to get a reading from it? A. At first, yes, Sir. All I recall getting was a lot of static.

Q. Did you leave it on? A. Yes, Sir.

Q. Did you go back to it at all? A. No, Sir.

Q. Was it on at the time of the stranding? A. Yes, it was.

Q. For the record would you describe how you use the direction finder? A. The model which we had aboard was a simply operated one. It was a matter of switching on. There was a switch which was in one position. It was used for finding, for scanning, over the whole range of frequences. There was another switch which could be put into DF, which is the direction finder, and when the switch was put into the direction finding position it was then a direction finder. There was a large dial with a knob in the centre which turned around with a little indicator on it, and when this was turned a little pointer pointed at the frequency of whichever station one intended listening to; a pair of headphones plugged into this.

Q. Did you use the head phones that night? A. Yes, Sir. I did.

Q. Had you had occasion to use this direction finder on the previous voyage? A. You mean in the same area?

Q. In the same area? A. I do not recall actually using it off Roncador or Quita Sueno.

Q. Changes on this chart number 1218, Irish exhibit F, were they made by you while you were aboard the ship? A. I do not think so. I think possibly they were made by the previous man on the ship.

Q. Can you tell us what happened between the time the course change was made at 2100, when you came on bridge approximately; what happened between that and the time when you stranded, anything? A. Shortly after midnight I continued to search for the light on Roncador but nothing turned

Mr. There were a lot of rain squalls around during the watch. The sky was fairly clear with a little cloud. The moon was shining fairly good up to about 3 o'clock. From there on it clouded over. We picked up on the radar a strong echo and I think, if I recall rightly, it was at 7 minutes past 2, and we thought at first this echo may actually be the echo of the rather conspicuous wreck marked on the chart at Quita Sueno. A bearing and distance of that echo gave a position of the vessel quite close to the track line. However, after a few minutes this echo had disappeared, and we assumed it must have been a rain squall. At half past 2 we picked up an echo 15½° on the starboard bow and it was plotted on the radar. This is where this plot here begins.

Q. That is Irish exhibit DDD? A. That is correct, yes.

Q. And what did you think that was? A. We thought possibly another rain shower, but it was a good clear echo and we thought it may be another vessel.

Q. Did you and the Captain give any consideration to the possibility that it might have been an indication from something on Quita Sueno Bank? A. No, Sir, not when it was 15° on the starboard bow.

Q. You did not consider that possibility at all? A. No, Sir.

Q. When you obtained this indication on the radar could you see any lights at all? A. No, there were no lights at all visible.

Q. Were there any rain squalls in the vicinity? A. As I recall, Sir, yes, there were.

Q. Were any engine movements made at that time? A. At that time, no, Sir.

Q. What speed were you on? A. She was on full sea speed.

Q. Who was on the bridge at that time when you picked up that indication? A. I was there myself, the Captain was there and the lookout man.

Q. Where was the lookout man stationed? A. The lookout man was stationed on the starboard wing of the bridge.

Q. Where did you stand your watch? A. I moved round between both wings of the bridge, the wheelhouse itself and the chart room.

Q. Where was the Captain? A. The Captain likewise moved between the wings of the bridge, the wheelhouse and the chart room.

Q. What was the first indication that you had gone into shallow water? A. Shortly before grounding the Captain noticed that there was now a return showing on the depth finder.

Q. Had that been in operation right along? A. It was running at midnight when I came on watch and it remained running until grounding.

Q. Is it customary to have the fathometer on when you are on an ocean passage? A. In the area where we were, yes, Sir, it is customary.

Q. What did you as a seaman think, or what is your opinion as to what happened? Why did she go around? A. It is my opinion that we were set exceptionally to the Westward.

Q. Do you have any opinion as to the force of the current that set you Westward? A. How do you mean, Sir.

Q. What strength do you think it must have been to take you off a course which is indicated on the chart to be a considerable distance to the East of the Bank, at least the mid-section of the Bank? A. We were set approximately 30 miles or so Westward.

Q. That is right. What would the strength of the current have to be to set you that far over? A. It depends when we first felt it.

Q. Of course. A. If we had been experiencing the current from something like midday or at the alteration at 16.00, from midday up to grounding is about 15½ hours, 30 miles would be about 2 knots. If, however, this set was not experienced until the 16.00 alteration onwards the current would be increasingly greater.

Q. Suppose the set had not really occurred until you were right off Roncador Light? A. May I have the chart and dividers? We were off Roncador Light around 21.00, so that is about 4½ hours up to the time we grounded. Now to set 30 miles in 4½ hours is 4½ divided into 30 which is 7 knots.

Q. Mr. Healy, I notice you stated you changed the course at 14.00 and the course you had been on previously, there was about a knot difference between that and the courses you read from the course recorder? A. I am sorry?

Q. A degree - can you explain that in any way? A. Is there a difference of a degree?

Q. [illegible] course it would indicate that there was a difference of [illegible] to port? A. [illegible] course round there is just about the thickness of the ink, is it not?

A. That is right. I will show it to the witness. Q. Which course are you referring to?

Q. Let us take the 330° course? A. Yes, I read that as 329°. Yes, but we were allowing an error of 1° low on the gyro.

Q. Did you check the gyro from time to time on your watch? A. Yes, Sir. I did.

Q. Are you satisfied that you were on course? A. Yes, Sir, I am.

Q. As indicated by the gyro? A. As indicated by the gyro comparing it with the magnetic compass.

Q. Are you satisified that all the other equipment on the ship was properly operating, the navigating equipment? A. Yes, Sir, I am.

CROSS-EXAMINATION BY
MR JACOBSEN:

Q. Mr Healy, what is your age? A. I am now 26, Sir.

Q. The fathometer, or echo sounding device, on the IRISH SPRUCE, what was the maximum depth it could record? A. 600 fathoms.

Q. What is the maximum depth recorded on the tape or graph? A. the maximum was 600 fathoms.

Q. Would it show on the graph, that amount, if that depth were being recorded? In other words, does the capacity of the graph go to 600 fathoms? A. It is divided into a number of scales. The maximum one is from 0 to 600.

Q. Where is that graph? A. At Brownbank. There is intermediate range, if I recall, from 0 to 100 fathoms and then there is a lower range which I think is from 0 to 100 ft.

Q. Referring to Irish exhibit 00, what do <u>these</u> horizontal lines mean? How much depth is there between each horizontal line? A. When this is in the recorder there is a scale across the top, like <u>that</u>, and the scale is marked 0 and so on up to 600. These horizontal lines come in, depending on the range that is on, I think, every 10 or every 50 or whatever it is.

Q. Every 10 or 50 fathoms? A. Depending on the scale. When the scale is in place <u>here</u> it is obvious that you can just read them off.

Q. Do you know how you could tell it with the graph paper to know what kept them here, or what right? A. This graph paper when operating is normally on the machine itself and moves out like this.

Q. Is this the bottom on the starboard side, as you face the printing on the top? A. This is the deeper water, moving this way from right to left it gets shallower.

Q. At the time of the stranding you had a man named Freeney on the bridge, an unlicensed man? A. That is correct.

Q. And he was the only unlicensed man who was up there? A. Yes, Sir.

Q. Had the Captain been on the bridge with you during the entire watch, starting at midnight? A. For most of it. On a number of occasions he went down for a couple of minutes.

Q. He had been there basically almost all of the time? A.Yes, nearly all the time.

Q. Was it the regular practice on the IRISH SPRUCE to have a lookout on the bridge? A. Yes, Sir, it was.

Q. As opposed to having one, say, on the bow? A. The regular practice in clear weather was on the bridge.

Q. Was it the regular practice on the IRISH SPRUCE at night to have only one unlicensed man up there at a time? A. That is correct, Sir, yes.

Q. Who was on the radar, if anyone? Was anyone stationed on the radar? A. I referred to it from time to time. The Master referred to it from time to time.

Q. It was on automatic steering, was it? A. Yes, Sir, it was on automatic steering.

Q. Was the unlicensed man assigned the duty to check to see that the ship was on the proper course from time to time? A. No, Sir, he was not.

Q. Did anyone check the course from time to time? A. Yes, I did myself.

Q. I understand that Freeney was a J.C.S., a Junior Ordinary Seaman? A. Yes, Sir, a Junior Ordinary Seaman.

Q. Referring to the radar, had you had any trouble with the radar or had there been any trouble with the radar since you were on board? A. Since I had been aboard,no. When I joined the vessel at Rushbrook the radar was then just installed.

Q. The Captain testified about something of repairs being effected in New Orleans to the radar. Would this be before or after what you are talking about? A. It must have been at the time because I joined the ship in Rushbrook and the radar had just been fitted and this was in July.

Q. About "fitted", do you mean new or just repaired? A. It was a new radar, brand new. The old radar had been removed, and it was a completely new installation..

Q. What make was the radar? A. Marconi, Mark 12.

Q. Where is Rushbrook? A. It is in County Cork and there is a dry dock there.

Q. I believe that the ship was in New Orleans after that time?

A. Yes.

Q. So that something was done to the radar in New Orleans, according to the Captain? A. I recall, yes, there was some problem with - I do not know what it was. It is too technical for me. There was something the matter with its sparking inside.

Q. The Captain testified to the effect that he had had some difficulty in getting signals on objects in a shorter, closer range. Did you ever experience that difficulty? A. No, I have never experienced that difficulty.

Q. You were using a DR speed of 14 knots, is that right? A. That is correct.

Q. Were you satisifed with that as being accurate and as much as possible DR speed? A. Yes, Sir, I am. This is later borne out by this actual plot.

Q. On that plot, I have looked at that, exhibit DDD, and I note that between 02.36 and 02.45 the relative distance between those two positions and the target or signal was about 1.7 miles. Would you check that?

A. Between 02.36 and 02.45 - I have no scale on this. It is a quarter of an inch to one mile.

Q. There is a scale on the bottom of this. A. It is not quite half an inch, so it is not quite 2 miles.

Q. It is nothing under 2 miles - I measured about 1.7 miles. A. The scale of this sketch is a quarter of an inch to the mile.

Q. That is correct. A. I left the distance here in tenths of an inch, about 4½ tenths.

Q. Could you repeat the last part? A. The distance here along a scale of tenths of an inch I make about 4½ tenths.

Q. Which would give you how many miles? A. About 1.8.

Q. Or 1.75? A. The scale is rather small.

Q. In between 02.45 and 02.50 I have a distance of about 1.6 miles. Would you agree with that? A. Yes, I would.

Q. So that the relative speed of the signal or target on the first time frame from 02.36 to 02.45 would be about 11 knots; the relative speed of the target from 02.45 to 02.50 would be about 19 knots? A. Yes. I am not surprised. On this sketch here, these points are a lot finer than the actual plot on the radar which was done with a china-graph pencil.

Q. So it would be approximate? A. What I am saying is that the marks made by the chinagraph pencil would be fat, stubby marks where the pencil is, such that to measure small sections on the Plot with the accuracy you have mentioned is not possible on the actual plot on the radar. This sketch was done in ball point, which is a lot finer than the point made by the chinagraph pencil.

Q. So that would explain why the relative speed of the target changed from 11 knots to 19 knots in the time we are talking about? A. Yes, in short legs. Taken over a larger section it is quite okay.

Q. Referring to the RDF, did you testify that you turned it on? A. Yes, I did.

Q. And you left it on? A. I left it.

Q. Leaving it on would not have any significance, would it? A. I left it on because I noticed that sometimes as it warms up morethe use of it is better. When it warms up you often get a clearer response.

Q. It is not like a radar, is it? In other words, having an RDF turned on,unless it happens by chance to be tuned in right on the frequency of a radio beacon, would have no return, would it? A. It takes a couple of minutes to warm up. Having it turned on means it is ready for instant use.

Q. You have to turn the wheel, do you not, to take a bearing on an RDF? A. Yes.

Q. You have to turn the antenna which is the loop antenna or not? A. No, that is fixed. You have to turn the dial.

Q. You have to turn the dial? A. Yes.

Q. Does turning that also turn something else? A. It turns the works inside. The DF is this double loop type. It is not the single loop type where you actually have to turn the loop itself.

Q. With the double loop then you still have to turn it like tuning a radio station, do you not? A. Yes.

Q. Just like a radio in a house. Turning it on with it not being on a station means it is never going to come on until you tune it in, is that right? A. Yes.

Q. Were you aware that there was an areo radio beacon on San Andreas Island? A. Is I recall, Sir, no, not at that time.

Q. Were you aware that the areo radio beacon on San Andreas Island was not listed in exhibit J, in the geographical index? A. Yes, I am aware it is not in the text of that book.

Q. And were you aware that it is not in the alphabetical list of calls signs? A. Yes, Sir.

Q. And that it was not in the alphabetical index? A. Yes, Sir.

Q. Do you know what the power of the areo radio beacon was on San Andreas Island? A. The power, no, I do not know.

Q. Do you know whether or not the transmission was continuous? A. No, I do not know that.

Q. Have you learned since the stranding there was an areo radio beacon on San Andreas? A. Yes, I have.

Q. Is it true that under the circumstances that were present on the IRISH SPRUCE, namely, that conditions were not appropriate for evening star positions, there is no Decca Station in the area so that you can use the Decca Navigator and that the navigation lights are weaker, is it true it would be useful to use RDF if possible? A. If there were one within range and also the position of it would havea lot to do with it. For instance, if you were heading for a point of land or entrance to a port and there is a radio beacon at the entrance or near the entrance to that port, that radio beacon will be useful for the purpose of steering a course for that port. However, it will not be useful and give no indication of how

far from that part you are.

... When you took your position at the 24... did you take a run line during the morning? ... Yes.

... When did you run it up for an hour or two and then cross it with your local apparent noon? ... Yes.

... In effect you had a running fix? ... Yes.

... It is possible to do that with other objects beside celestial bodies? ... Yes.

... And it could be adapted to the radio direction finder? ... Yes. The nearest radio direction finder I was aware of was on Swan Island and that is a long way off. To do a running fix on Swan Island from the course that we were steering is just not on.

... Swan Island would have been ahead of you, would it not? A. It would have been ahead of us.

... So you would not have been able to get a running fix from that, would you? A. No, that is what I say. The change in the bearing would have been very small.

... It is a basic principle of navigation, is it not, to use everything that is available without relying solely on any one thing? A. Yes, that is true.

... How did your DR speed compare with your speed made good as it turned out? A. As I recollect, I think it was quite accurate.

... So that it was the set to the west that was the only thing different from your DR course and speed? A. Yes, Sir.

... You came on watch at approximately midnight, 24,00, and at 24.00 your DR position was some distance passed Roncador, is that right? A. That is correct, Sir.

Q. DR-wise you would have been off Roncador at approximately 23.00? A. That is correct, Sir.

... You said that when you had this target or signal at 15° on the starboard bow, you did not think that was the wreck at Quita Sueno? A. No, Sir.

... Why did you not think it was a wreck? A. We expected to pick up the wreck well around on the port side not 15° or so ...

... You thought you were substantially to the right then, further East?

Q. Further that, sir.

Q. With the weather as you described, I think you said force four or five, the lookout could stand on the bow safely, could he not? A. Safely, I would think so. I do not recall our taking much water over the bow at any time.

Q. Have you formed any opinion since the proceeding as to what the target or signal was on the radar that you observed at 34 miles, I think you said, at 01.00? A. Yes, my opinion now is that it was a rain squall.

Q. How are the Notices to Mariners received on the IRISH SPRUCE; who sends them to you? A. The Company send them out to us.

Q. That is the British Admiralty notices? A. The British Admiralty notices.

Q. Is it the practice to keep the full set of British Admiralty materials on board the IRISH SPRUCE? A. Yes, Sir, it is.

Q. You do not have a full set of anything of the American nature, do you? A. Of any other nation, no.

Q. Do you have any British pilot charts on board? A. What do you mean by a British pilot chart. To the best of my knowledge they do not produce something of that nature.

Q. That was my question. I was referring by comparison to the American pilot charts which have been marked earlier today. The ones marked today were the pilot charts North Atlantic Ocean, which is a rather small scale chart, but do you have any similar British type of production? A. To my knowledge, no. They do not produce something like that.

Q. The information that would be on a pilot chart of the American nature, I take it, would be in the same direction as the British system? A. Information of a similar nature, yes, Sir, it would be.

Q. Do you remember Mr Halbott coming aboard? A. Yes, Sir, I do.

Q. He came on board in company with another surveyor, Mr Horvath? A. Yes, Sir. I do not remember the names but I do know the two gentlemen you arereferring to.

Q. I know Mr Halbott went out on a fishing boat, and I do not know how Mr Horvath got there. Did he go the same way? A. They came together.

Q. Did you see them; were they on board? A. Yes, Sir, I did.

Q. Mr. Did you show Mr Talbott certain materials in the chart room or wherever while he was on board? A. Yes, all.

Q. Were you with him when he looked at the various stuff which he looked at on board? A. At times, not all the time.

Q. Did you produce the stuff that he asked for? A. Yes, Sir, I did.

Q. In other words, were you the representative of the ship who produced the materials he asked for? A. Anything he asked me to show him I showed him and that was it.

Q. Mr Talbott informed me that there were not any pilot charts for January on board the UNION SPRUCE, would you agree with that or disagree? A. Are you referring to the American ones?

Q. To the American pilot charts? A. I think we already have January here, have we not?

Q. You have them here today but my question is, do you agree with Mr Talbott when he says that they did not have those on board the UNION SPRUCE when he went on board?

MR BAILLIE: Mr Jacobsen, I object to the form of the question unless you add the year.

MR JACOBSEN: Any year. A. Well, these American pilot charts for January, which we have here today, they were on board the SPRUCE. Therefore, they must have been aboard when these two gentlemen came on board. I cannot agree with them that they were not.

Q. Where were the pilot charts kept, in any particular place on the ship? A. They were kept in a drawer in the chart room. Normally one pilot chart, that is, the most recent one or one of similar month, I usually had out on a drawer and had it on a rack which lies alongside the chart table.

Q. How are the U.S. pilot charts obtained? A. We have only received these pilot charts in ports in the U.S. or in Panama.

Q. Was it any regular practice or was it just a chance thing that somebody might give you one and you pick one up? A. I never recall them actually being mailed to the ship.

Q. In other words, there was no regular way in which they were received, is that correct? A. So far as I know that is correct.

Q. Referring to exhibit DL, you have testified that this is your personal journal, is that correct? A. That is correct, Sir.

Q. And that is entered in December, 1971? A. On 24th December.

Q. Can you tell me, please, that it entered at that time? A. Well, I am under no obligation whatever to keep the journal in the first place.

Q. And when did you bring this book to Ireland? A. When I left the United States, was about three weeks or so more, shortly before Easter.

Q. I note that this entry on the article, Groundings, U.S. pilot charts for North Pacific November, 1971, is in a different ink. Why is that? A. Because I wrote that in afterwards, having read the article. I decided to make a note of it in my journal and that area there and some of the information there is, concerned, I think, about this particular area.

Q. Timewise it is in the September, 1971, area, and certainly at that time the November pilot chart was not out yet, was it? A. That is correct, Sir. It is in different ink because it was put in at a later stage.

Q. Was it put in after you returned to Ireland? A. No, it was put in, so far as I recollect it would have been the month of December.

Q. I have not checked the whole book but I do not recall seeing any other entry about pilot charts in there. Do you recall whether or not there are any other similar-type entries? A. I cannot recall. I do not think so.

MR. JACOBSEN: That is the answer to your question, Mr. Baillie; why I want to mark the whole book.

MR BAILLIE: You say that answers it, that you do want the whole book marked?

MR JACOBSEN: Yes. Referring to exhibit XX-1, the January, 1971, pilot chart, there is a stamp up here in the left-hand corner, magenta or whatever, what is that about? Can you tell us? A. Yes.

Q. What language is that? A. It is Irish, Gaelic, and it is the Department of Transport and Power.

Q. Then what is the next thing? A. I have forgotten my Gaelic. I do not know. That is the 4th January, 1971. I am not sure of my Gaelic on this but I think it reads Meteorological Department.

Q. Could that have been stamped in Dublin? A. I assume with that stamp on it must have been.

Q. Where was the [illegible], say, January 4th, 1971? A. If I remember she was in Dublin or Manchester.

Q. Is the implication then from the stamp on this particular pilot chart, that is 1211, that it arrived on the UNION SPRUCE from the Company? ... You mean, did the Department of Transport and Power first give it to the Company and they forwarded it on to the ship?

Q. Let me change the question. Do you have an opinion as to how this particular pilot chart got on board the UNION SPRUCE? ... From the stamp which you have just shown me it is my opinion that it came aboard the ship through the Department of Transport and Power here in Dublin.

Q. Is that the only one that has a stamp that you can recall? A. I honestly do not know.

Q. So far as you know there is no regular practice as to how you receive U.S. pilot charts on board the ship. Is that correct? A. As far as I know that is correct.

Q. Is it correct that you do not know when it occurred or how much set the UNION SPRUCE experienced between the noon position on the 26th and the time of stranding? A. That is correct.

Q. You have no way of really knowing at this point, do you? A. We have no way of really knowing, no.

Q. I take it the Master was in charge while he was on the bridge? ... What do you mean by that, Sir?

Q. Exactly what I say, that he was in charge while he was on the bridge on your watch after midnight on the 27th? A. Yes, Sir, that iscorrect.

Q. The British Admiralty chart, 1215, exhibit F, which you referredto from time to time today, that isthe last issue of that chart on board, is that right? A. That is correct, Sir.

Q. Did you ever receive any instructions from the Company about the use of radio direction finders? A. No, Sir, not that I recall.

Q. Is it the regular practice on the UNION SPRUCE to put out the pilot chart for the month in question? A. It was my regular practice, yes.

Q. The Captain stayed on the 330° true course for about an hour after Moncador, that is from 23.00 to 24.00; that would take him further off vita Bueno, would it not? A. It would take Her further to the Eastward, in other words, further to the .....

Q. Further to the right before changing course to 323° at midnight. Were

[illegible] on the [illegible] at midnight? A. When I came on watch at midnight we were steady on that course.

Q. [illegible]? A. On the 320° course.

Q. It was supposed to be at midnight? A. The alteration had just been made.

Q. Do you know whether there has been any written report to the Irish Government at all about this stranding?

MR. [illegible]: No further questions at this time.

[illegible]:

MR BRILLIG: From the log, Mr Jacobsen, I note that the LIMON STRUCK was in Dublin commencing on 17th January, 1971, I believe, and for at least several days thereafter. It would be necessary for me to have copies of this made and marked as exhibits or would you accept the fact that the log so reads?

MR JACOBSEN: I accept it.

MR BRILLIG: There has been a question left dangling here, Mr Healy, and I think maybe the Judge who hears the case would want to have an answer to it. If you did not know that there was a radio station on San Andreas Island why did you turn the DF on? A. I was aware there was a radio station on Swan Island.

Q. How far away was the ship from San Andreas Island when you came on watch? A. From San Andreas, we were well to the North of it, about 115 miles.

Q. Swan Island was considerably further, was it not? A. Yes, Sir, Swan Island does not even appear on this particular chart.

Q. What does it depend upon, the power of the sending station whether or not you are going to get it? Is it not a line of sight proposition? A. Yes, it is a line of sight proposition. It does depend on how powerful the transmitting station is.

Q. Would you ordinarily pick up something 110 miles away or 115 miles or whatever, would you say? A. Not unless it was one of the very good direction finding stations.

Q. Of course the same thing would be true about Swan Island only more so? A. The same thing would be true, yes, of course. Being further away it would have to be a more powerful station.

Q. Why did you not go back to the direction finder? Did you forget about it, or what? You say you did not return to the direction finder after you had turned it on? A. That is correct, Sir. The first time I tried to use it I got nothing but static. I do not know. I just never returned to it.

Q. What direction were you from San Andreas Island when you were given the position of the vessel at the time when you first came on watch? A. When I came on watch at 24.00 San Andreas would be to the South-westward of the ship. In other words, the ship would be to the North-eastward of San Andreas.

Q. Do you not think it would be a little finer angle than that? What would be the bearing; could you figure it out from plotting? Here are a pair of parallel rulers. A. I read it as 050° or 051°.

MR JACOBSEN: What is the reciprocal from that? A. You mean from the ship to the station - 231°.

MR BAILLIE: The angle is getting narrower as you are going North-westwards, is that right? A. As we proceed further North-westwards - when you say the angle is getting narrower, I do not quite follow?

Q. Well, San Andreas comes more in line with the vessel? A. It comes more in line with our course line, yes.

Q. Of course, if you had already been set more to the West you would have been even still more narrow? A. If the vessel were further Westwards, yes. The angle between the ....

Q. The course line and the direction from San Andreas to the vessel? A. It would be slightly narrower, so what.

CROSS-EXAMINATION BY MR JACOBSEN:

Q. When you came on at midnight you were on 323°, is that right? A. 323°, that is correct.

Q. Along the course line that you have already put on the chart 1218? A. Yes.

Q. And at midnight your DR position was right here, where it is DR 24.00 exactly, is that right? A. Yes, Sir.

Q. And San Andreas is there. So it would be fair to say it is about perpendicular to your course line? A. At that point not far from it.

... in the area of being perpendicular? ... A couple of degrees.

... if you were further to the west and bearing in mind that your course proved to be about correct, that would not really change the angle, would it? ... Well, take a position way over here to the eastward - there. - with our course that way, the bearing of San Andreas is still not too far from a right angle.

... Mr Healy, if you are on your 323° course and you keep your ... speed of 24 knots and you are set to the west you will move yourself eastward but parallel to your 323° course.is that correct? In other words, if you are here where you have your 23.00 position and you feel that you are further west. If you are further west you are not going to put yourself further along the course line, you are just going to transfer your course line further to the west, parallel to 323°? A. Yes.

Q. So it will not make any difference to your angle on San Andreas, would it, at 23.00 or 24.00? It is still going to be in the area of being perpendicular. A. The bearing on the station will be the same. For instance, this bearing here - I will not move this. In other words, with the set-square here and the pair of parallel rules, they are perpendicular to each other. Now anywhere I move this there; anywhere I move this, Eastward or Westward, the bearing will remain the same.

Q. Thank you. One document we requested production of was an RDF operating manual, so my question is both to counsel and to Mr Healy. Did you have an operating manual on board and if so is it available? A. We did have an operating manual on board. Where it is now I do not know.

Q. Is it possible that you would have aduplicate of that with the Company here? A. That I do not know.

Q. Was it a Marconi radio direction finder? A. It was a Marconi.

Q. And do you know the mark or type? A. I cannot recall what type itwas.

Q. There must be a record of that, if so I think that a duplicate of that would be avilablefrom the Company, and I ask for production of that at a convenient time. I do not need to ask any further questions with respect to the manual, I would just like to get it in due course, but you will not produce what you cannot find. Did you make any written reports yourself of the stranding or events leading up to it? A. I did.

Q. Do you have a copy of that? A. Yes, I do.

[redacted] have a copy thereof? A. I have a copy.

[redacted] Mr. Healy, do you have a radar observers' ticket? A. Yes, I do.

Q. Where did you obtain that? A. I obtained it in Plymouth.

Q. You had on the IRISH SPRUCE a plotting head or plexi glass, a flat glass on top of the radarscope? A. On top of it, yes.

Q. Did you have anything on the side which would enable you to make a plot of course and speed of any contact or signals you obtained? A. It could be done on the suface of the scope itself with the grease pencil.

Q. Was it the practice on the IRISH SPRUCE to make a plot of any contact that came along, a plot on the side on a separate thing that would have plotting paper? A. It has not been my practice to do that, no.

Q. So far as you know is it the practice of anybody else on the IRISH SPRUCE? A. As far as I know it was not. There was a plotting sheet which was in use with the previous radar, the radar set which was removed in dry dock in Rushbrook. This was a plastic device about 2 ft. sq., just circular with concentric rings and what not, and a scale marked on the outside of it. That was still on board. The other radar set did not have this perspex on top of the radar.

Q. What was on the plexi glass frame that was on the radar that was on the IRISH SPRUCE at the time of standing? Were there any markings on it? A. It was graduated from 0° to 360° around the edge of the scale, and then there was a parallel grade as well on it.

Q. A parallel grade? A. Yes.

Q. I take it it was not the regular practice to calculate the course and speed of signals observed on the radar. Is that right? A. Not unless there was some specific reason for doing so, but it could be done on this.

Q. It could be done? A. Oh, yes.

Q. But in general it was not done, is that right? A. This is what this plotting perspex cover was for.

Q. You are saying it could be done if you had a target in two positions that you could plot both those positions on the plexi plotting? A. Yes.

Q. And could you run that vector over and make a plot so that you could

[illegible] contact? -. I do.

-. [illegible] this was not done on the [illegible], in this connection? -. I do not know about the other officers. I do not follow that when you say "on ground."

-. Is it not usually the practice [illegible] to put the grease pencil on the exact spot where the signal was and then put a time, and then put another grease pencil mark after the contact has actually moved along a bit and then just draw a relative line of movement of the contact? -. Yes, this line could be drawn. There was a small parallel ruler also provided with which you could actually join these.

-. My question was that this is what was usually done to put the relative movement line on? -. To put the relative movement line on, yes.

Q. But not calculate the course and speed of the other contact?

-. Not normally in clear weather, no.

MR. JACOBSEN: I ask that this be marked as an exhibit.

MR. BAILLIE: GGG

MR. JACOBSEN: I have no further questions of this witness.

MR. BAILLIE: Thank you very much, Mr Healy.

DEPOSITION OF THOMAS O'CONNOR

Third Officer of tl e "Irish Spruce" (Ex. 65)

[illegible]

. [illegible] ... [illegible] O'Connor.

. [illegible] ... [illegible], County Kerry.

. [illegible] ... Irish Shipping Limited.

. In what capacity? ... Third Officer.

. Do you hold an Officer's Licence? ... I do.

. By what is that licence issued? ... The Department of Transport and Power.

. Is that of the Republic of Ireland? A. Yes.

. What licence is that? A. Second Mate's Licence.

. Are there any restrictions on the licence? A. No.

. When did you obtain that licence? A. June, 1970.

. How long have you been going to sea? A. Nearly six years.

. Have you attended any nautical schools? A. I have in Plymouth for six months.

. And when was that schooling? A. That was mid-way through my apprenticeship with Irish Shipping.

. Would that be before you received your Second Officer's Licence? A. Yes.

. Were you an officer aboard the IRISH SPRUCE in January, 1972? A. I was.

. What specific officer were you? A. Third Officer.

. How long had you been aboard the vessel? A. Since August, 1971.

. Did you stand any particular watches? A. Yes, the 8 to 12 watch.

. That is 8 to 12 in the morning and again in the evening? A. Yes.

. Would the evening watch be the 20.00 to 24.00 watch? A. Yes.

. Have you ever sailed in the Caribbean before? A. I have.

. Were you aboard the vessel, the IRISH SPRUCE, in August, 1971? A. I was.

. Do you recall if the vessel made a transit from Panama to ports in the United States Gulf Coast at that time? A. Yes.

. Were you aboard at that time? A. Yes, I was.

. Were you a watch-stander at that time? A. I was.

Q. Could you check this log book for the period of that voyage which would be on or about 30th August? A. I do.

Q. What entries have been written by yourself? We are referring to the exhibit, copies of which will eventually be marked SC 1, in any event it is the log book of the [redacted] for the period on or about August 29th to August 30th. Can you tell looking at this log where the vessel was on the 29th August, 1971? A. I can.

Q. Where was she? A. She was at Panama.

Q. Would you look on August 30th, and can you tell where the vessel was at that time? A. She was on transit from Panama to New Orleans.

Q. Were you on watch at any part of this time between midnight and 8 o'clock in the morning? A. Yes, between midnight on the 30th?

Q. Are any of these entries in your hand writing? A. No, these are the second officer's hand writing, except this one here.

Q. Referring to the entry at 09.22 hours, that is in your hand writing? A. That is right.

Q. Were you on watch on the morning of January 26th, 1972? A. I was.

Q. Did you make anycelestial observations that morning? A. I did, yes.

Q. How did you do that? A. By taking sun sights at about 9.30 or 10 o'clock in the morning and moving up the morning position line until noon that day and then taking noon sights.

Q. And that results in a fix? A. Yes.

Q. Do you recall what that noon position was? By referring to the log book could you tell us what that noon position was? A. The noon position for that day was 11° 13' North and 79° 26' West.

Q. Did you confirm that position with any other officer aboard the ship? A. I did.

Q. With whom? A. The Second Officer.

Q. Did you have confidence in that position at noon on the 26th? A. I did.

Q. Were you on watch again during the day on the 26th? A. I was, between 20.00 hours that night and midnight, 24.00 hours.

Q. When you assumed the watch at 20.00 hours do you recall, or by referring to the log book can you tell us now, what the course was that the vessel was on? A. She was on 330° true and 329° gyro.

Q. Did you expect to observe any light to port from during the course of your watch? A. I did.

Q. What light would that have been? A. Roncador Bank.

Q. What time did you expect to pick that up? A. Around 10.30 - between 10 o'clock and 11 o'clock that night.

Q. Do you repeat that in terms of the twenty-four hour clock? A. Yes, between 22.00 hours and 23.00 hours that night.

Q. You expected to pick up Bone Bor? A. Yes.

Q. What did you expect to do when you did pick up that light? A. I expected to alter course.

Q. In which general direction were you going to alter course? A. Towards the North-west.

Q. Did you in fact pick up that light at the time you expected to? A. No.

Q. What then did you do? A. I called the Master.

Q. You called the Master? A. Yes.

Q. What did the Master do in response to your call? A. He came up on to the bridge.

Q. About what time would this have been? A. Around 22.15.

Q. Did the Master remain on the bridge then for the rest of your watch? A. He remained on the bridge for about half an hour and then he went down for a short period and then he came back up again and he remained there until I went off watch, and he was still there when I went off watch.

Q. What did you do in looking for Roncador? A. I gave the binoculars to the lookout man and I told him to keep a constant look out and I remained at the radar myself.

Q. Did you look out for it at all with the binoculars yourself? A. I did.

Q. Did you see it on the radar? A. I did not.

Q. What ranges did you have the radar on? A. On the 12 mile range and the 24 mile range.

Q. You looked for Roncador on the 24 mile range? A. Yes.

Q. Did there come a time on your watch when you did in fact change course? A. Yes.

Q. To what new course did you change? A. At 24.00 hours I altered course

to [illegible] time and [illegible] gyro.

Q. And there was at the master's instructions? A. Yes.

Q. And the radar on during your entire watch? A. Not during the entire watch. I switch it on about 20.30.

Q. And the fathometer on at all during your watch? A. Yes, it was.

Q. And the course recorder in operation? A. It was.

Q. When you made the alteration of course at midnight was it pursuant to the Captain's orders? A. Yes.

MR. MOULIN: No further questions.

CROSS-EXAMINATION BY
MR JACOBSEN:

Q. Did you use the RDF at all on your watch from 20.00 to 24.00 on the 26th? A. No.

Q. Were you aware that there was an areo radio beacon on San Andreas Island? A. No.

Q. Referring to exhibit J, Radio Signals 1969, which is from the IRS CPHTOD, were you aware that this book of radio signals does not list San Andreas areo radio beacon in the geographical index? A. No.

Q. Were you aware that it did not list the radio beacon in the alphabetical index? A. No.

Q. Were you aware that it did not list San Andreas areo radio beacon in the alphabetical list of call signs? A. No.

Q. Do you know how to use the RDF? A. I do.

Q. Do you know what the power of the radio beacon was on San Andreas? A. No.

Q. If you had known that there was an areo radio beacon on San Andreas and if it had a range of more than 150 miles, would you have used it? A. I might have but I would not be very confident in the results I would get due to night effect.

Q. You would try to use all the means available to you though to ascertain the position of the ship, would you not? A. I would.

Q. And you could not use the Decca navigator because there were no Decca stations in that area? A. No.

Q. And weather conditions prevented star sights that evening, did they not? A. They did.

[illegible] Q. [illegible] on the nautical list or in the [illegible] should list in exhibit 37 [illegible] I cannot remember [illegible] I am not sure whether I do or not.

Q. If you did you cannot recall whether or not you looked for San [illegible] will, in the [illegible] A. [illegible].

Q. Have you ever had an intervention on the operation of the radio direction finder? A. No.

Q. Is it the regular practice on the M/V M.H. SMITH to use the British Admiralty sailing directions for the areas through which the ship is sailing? A. Yes, it is.

Q. Are you yourself accustomed to looking in the British Admiralty sailing directions? A. I am.

Q. Is the ship equipped with the British Admiralty publications? A. It is.

Q. Did you make any statement to the Company or anybody else after the stranding? A. No, I did not.

Q. You did not make any statement like "The Captain did ...." or "The Second Mate ...."? A. No.

Q. Did you see the Spanish when they came on board? A. Who?

Q. Let me ask you another question first. Did you stay on the ship the length of time that the Captain did or did you leave before that? A. I left before that.

Q. When did you leave the ship? A. About five weeks after she went aground. The exact date I cannot remember.

Q. As I recall it the Spanish were aboard round about 4th or 5th March. Do you remember the coming aboard from a Spanish vessel? A. No.

Q. I should not say "Spanish", should I, but Columbian? A. No.

Q. Did you maintain any work books or personal journals on the M/V M.H. SMITH? A. No.

MR. JACOBSEN: I have no further questions at this time.

RE-CROSS EXAMINATION BY
MR. ROSE:

Q. Mr O'Connor, you testified that you knew how to work the RDF but that you had not received a formal course in it, as I understand it. Did you learn how to operate it then from other officers? A. I did.

Q. I show you a document entitled Admiralty List of Radio Signals, [illegible] and previously been identified as Irish exhibit C. Do you recognise that as being a publication that was aboard the IRISH SPRUCE? A. I do.

Q. Where was that kept? A. On the bridge.

Q. Could you look at it any time you wanted to? A. Yes.

Q. Could you leaf through it, flip through it, look at any part of it? A. I could yes.

Q. I will show you another publication entitled West Indies Pilot No. 2, supplement six, the former being identified as Irish exhibit C and the supplement is Irish exhibit C 2. I ask you whether you recognise this document? A. I do.

Q. Was that on board the IRISH SPRUCE? A. It was.

Q. Were was it kept? A. On the bridge.

Q. Did you have access to this book? A. Yes.

Q. You could look through it when you wanted to? A. Yes.

Q. Any part of it? A. Yes.

MR JACOBSEN: I would like to mark this book itself, thepersonal journal of Mr.Healy. If you remember, before we were going to make copies of the pages but I would also like to mark the book itself.

MR BAILLIE: This is a personal book of his. It is not a record of the Company at all. I do not see any reason why we should even produce the thing. If Mr Healy has no objection to it's being used I am perfectly willing to have it done but I know he wants it back.

MR JACOBSEN: I will state my position, and you can do as you wish, but on direct examination reference was made to this page, on which there is reference to a pilot chart of November 1971, a U.S. pilot chart, and it is in different coloured ink, and I want the book because a copy will not show that. So I request that it be marked itself.

MR BAILLIE: We do not want to hide anything. He has already said and admitted it is in different coloured ink. It is right in the area of voyager from Galveston to the Panama Canal. I do not know why it is not in the most logical place possible.

MR JACOBSEN: It was used on "direct" here today.

MR BAILLIE: You are right there; that page was used. What has the rest of it got to do with that? We admit that it is in different coloured

[illegible], whatever it is. How long are you going to need it?

MR JACOBSEN: I would want it indefinitely for the course of this case.

MR BAILLIE: We will ask that it be preserved here; we will ask that a photostatic copy be made of just that page and we will go to Courts. You can make as many fishing expeditions as you want into the papers and the property of the company but I do not see why you should pry into someone's personal journal. It is an imposition.

MR JACOBSEN: I request that the evidence that has been used here today be marked.

MR BAILLIE: The evidence that has been used here today is one page, and we are willing to stipulate that that is in different ink.

MR JACOBSEN: I am sorry, but that is my position. I request that book to be marked. I have no further questions of this witness.

MR BAILLIE: I will see if Mr Healy has any objection to our taking the book with us and using it for a reasonable length of time. I will not permit it to be kept indefinitely in the United States, unless some Court orders me to do so, or rather, orders the Irishing Shipping Company to do so.

[illegible] having been recalled, testified as follows:

[illegible]: These gentlemen have requested that they be allowed to certainly to preserve this book in its original form. What I am going to propose is that you entrust it to me for a matter of, say, a maximum of three months, and I will see personally that it gets back to you and I will insist they make only such examination as they wish, by an expert of their with or whatever, in that time. ... It is quite all right as long as I get it back at some stage. There are a lot of memories in this thing.

MR JACOBSEN: The only thing I would like to make clear is that my request is that it be preserved.

MR BRILLIS: If you are going to have it studied by an expert for analysis of the hand writing and that sort of thing, I do not see why it cannot be done and the report be made available for the trial.

MR JACOBSEN: I have not said anything about analysis. I thought I made it clear. My request is that it be kept until the trial. It is up to you to do what you want to do.

MR BRILLIS: I will promise you this, Mr Healy. I will get it back toyou as soon as I can get it back. A. The way I feel is this: It is okay to take it as long as I get it back at some stage.

MR BRILLIS: He is talking about a matter of two or three years.

MR JACOBSEN: I think we ought to mark it.

MR HOUSE: Exhibit DD, which would have been the photo copy of Mr Healy's entire book.

DEPOSITION OF JAMES D. McGINTY

Master of the "Pioneer Crusader" (Ex. I)

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	72 Civ. 3199
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, -against- S.S. IRISH SPRUCE, her engines, tackle, etc., -and against- IRISH SHIPPING LTD., Defendants.	72 Civ. 656

TESTIMONY OF CAPTAIN JAMES D. McGINTY taken by the Plaintiff pursuant to the provisions of the Federal Rules of Civil Procedure and the within Stipulation, at the offices of Messrs. Montgomery, Barnett, Brown & Read, at New Orleans, on September 20, 1973.

Dietrich & Pickett, Inc.
Stenotypists
333 ST. CHARLES AVENUE, SUITE 1221
NEW ORLEANS, LOUISIANA 70130 - 522-3111

I N D E X

Witness	Direct	Cross	Redr.	Recr
Capt. James McGinty	3	27	77	--

E X H I B I T S

Exhibit No.	Identified
Captain McGinty No. 1	18
Captain McGinty No. 2	20
Captain McGinty No. 3	38
Captain McGinty No. 4-A	40
Captain McGinty No. 4-B	40
Captain McGinty No. 5	78

APPEARANCES:

For the Plaintiff:

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By: FRANCIS M. O'REGAN, ESQ.

For the Defendant:

MESSRS. HEALY & BAILLIE
Attorneys-at-Law
29 Broadway
New York, New York

By: JOHN C. KOSTER, ESQ.

HELEN R. DIETRICH
Reporter

...ooo...

S T I P U L A T I O N

IT IS STIPULATED AND AGREED by and between the parties that the testimony of the witness, CAPTAIN JAMES L. McGINTY, may be taken down in shorthand (Stenotype) by Helen R. Dietrich, and by her transcribed or transcribed under her supervision, the formalities of signing, sealing, certification and filing being waived, and all objections, save to the form of the question, being reserved to the time of trial.

IT IS FURTHER STIPULATED that the

testimony may be taken before the said Helen R. Dietrich in her capacity as Notary Public in and for the Parish of Orleans, State of Louisiana.

...oOo...

CAPTAIN JAMES D. McGINTY,

having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. O'REGAN:

Q Captain, what is your name, please?

A James D. McGinty.

Q And where do you live?

A 1050 North Point, San Francisco, California.

Q Are you bound on a trip to some place at the present time?

A Yes, on a voyage from New Orleans to India.

Q And how long will you be out of the country?

A Approximately two months.

Q Captain, by whom are you employed at the present time?

A United States Lines, Inc.

Q In what capacity?

A Master.

Q Of what vessel?

A The S/S PIONEER CRUSADER.

Q Do you hold a license of any sort?

A Master's license, unlimited tonnage, radar-endorsed.

Q Captain, how long have you been employed by United States Lines?

A Thirty-one years.

Q In what capacity?

A From junior officer to master.

Q Would you give us roughly the years you served in these capacities, in each capacity.

A From 1941 to 1943, junior officer; from 1943 to 1946 I was on active duty with the United States Navy; from 1946 to approximately '53, second to chief officer; and from 1953 onwards as master with United States Lines, Inc.

Q And, Captain, you said you had a radar endorsement on your license. What does that mean?

A A radar endorsement is a Coast Guard equivalent or Coast Guard issuance of competency in radar plotting, theory of radar, et cetera.

Q And would you tell us something about your educational background.

A I was educated in the parochial and public school systems of New York City through high school, and I am a graduate of the New York State Maritime Academy in 1941.

Q What has your seagoing experience been?

A Well, continuously employed by U.S. Lines since graduation from New York State Maritime Academy on cargo, passenger and container vessels.

Q Are you presently master of the vessel, United States Lines vessel called the PIONEER CRUSADER?

A I am.

Q And when did you become master of that vessel?

A June, 1973.

Q Have you ever operated radar as a navigational aid?

A Yes, I have.

Q Have you ever used the radio direction finder as a navigational aid?

A Yes, I have.

Q Have you ever operated loran as a navigation aid?

A Yes, I have.

Q Now referring to the three instruments I just referred to, --

A Both as navigator and also as the ship's master.

Q -- do you find them useful navigational aids?

A Yes, I do.

Q What type of vessel is the PIONEER CRUSADER?

A The PIONEER CRUSADER is a dry cargo vessel of 570 foot length, 72 foot beam, approximately 12,000 tonner.

Q Does the PIONEER CRUSADER have radar?

A It has radar.

Q Does it have loran?

A It has loran.

Q Is it equipped with a radio direction finder?

A Yes, it is.

Q What type of radio direction finder is the vessel equipped with?

A I have made a note of it somewhere here. It is an RCA Radio Direction Finder. You have the technical data in the papers there (indicating), we jotted it down as a note.

Q Captain, what is the practice if any on the PIONEER CRUSADER as far as using loran, radar, and RDF? We will refer to the radio direction finder as RDF. What is the practice of using these pieces of equipment for navigating?

A We use all means of navigation available: loran if we are in areas where there is loran reception, radio direction finder, star and sun navigational aids.

Q When you say star and sun navigational aids, is that what is known as celestial navigation?

A Celestial navigation.

Q And do you use that as a check against

your other sources of information? 8

A Yes, we use all aids to check one against the other positions.

Q Are there any orders from you to your officers regarding the procedures for navigating the vessel while at sea?

A Yes, I have a standard operating procedure for watch officers which also is included in your pile of papers there, Mr. O'Regan, if you will find it.

Q Would you point it out to us?

A Yes.

Q Would you point out the specific documents to which you are now referring?

MR. KOSTER:

I want to note an objection on the record, not specifically as to form but in due course I will object to the relevancy of this entire line of questioning.

A I am sorry, I cannot find it. It is the standard orders and operating procedures for watch officers on the

bridge of the PIONEER CRUSADER made up in typewritten sheets, approximately six sheets. One of the paragraphs covers this navigational procedures, instructing officers to use any and all aids available.

BY MR. O'REGAN:

Q This is for the purpose of navigating your vessel while at sea?

A For navigating the vessel while at sea or piloting.

Q Do you know where those typewritten sheets are now located?

A I did believe they were in among these papers that we have here, Mr. O'Regan. We seem to have misplaced them somewhere. It is a typewritten sheet eight by 12.

Q Does the information contained therein indicate your orders to your navigators, your watch officers?

A Yes, it specifically --

Q -- as to the procedure of navigating your vessel?

A It specifically spells it out, yes.
Q To the best of your recollection what do those orders say as far as navigating the vessel and using the navigational aids available?
A I am repeating. It specifically instructs them to use any and all navigational aids available.
Q And how do you delegate to your officers the responsibility for navigating your vessel while at sea?
A I usually delegate complete responsibility to watch officers after having convinced myself that they are competent.
Q What do you mean by that?
A By observing them in their standing of their watch, their capabilities in handling the various pieces of equipment, and of course in their celestial navigation.
Q Have you specifically observed each of your officers who are now serving on your vessel, have you observed their ability to perform navigational tasks while at sea?

A Yes, I have.

Q And have you also observed the ability of the officers who were on board your vessel on September 2, 1973 while the vessel was operating at sea?

A Yes.

Q Do you have an opinion as to their competency?

A Yes, sir, they were completely competent.

MR. KOSTER:

Off the record.

(Discussion off the record.)

BY MR. O'REGAN:

Q Captain, what is your practice if any in connection with the supervision of officers on your vessel while the ship is at sea? I am talking now in terms of navigation.

A At sea in deep water I usually supervise the noon position, morning and evening celestial fixes; piloting in close waters I usually supervise personally.

Q Do you have anything in your night orders

as far as using available means of navigation? 12

A Yes, I do.

Q As a rule I am talking about.

A No, it is usually covered by my standing orders.

Q Standing orders. I see.

A Unless there is a specific reason to.

Q What is the reason?

A Well, can I quote this?

Q Certainly.

A This is on a voyage from Cristobal, Canal Zone, towards New Orleans, Louisiana.

Q What date, Captain?

A The 2nd of September, 1973. I always preface night orders with the standard standing orders, and then quoting my night orders for that evening:

"Fix vessel's position frequently adjusting allowing for set to Maica, course 337 degrees good, pass 15 miles off Cayos del Este Sudeste, pass 23 miles off Isla San Andrés, pass 11.5 miles west of Isla Providencia, then

change course 352 degrees true. Call me if in doubt. Watch the set off Quita Sueño Bank, take hourly RDF bearings on St. Andrés aerial beacon until abeam. Plot and label bearings." Signed "J. D. McGinty, Master." 13

These orders of course are initialed by the watch-standers.

MR. KOSTER:

May I ask the distance off Isla Providencia? I didn't quite catch it.

THE WITNESS:

Twenty-three miles off Isla San Andrés and 11.5 off Isla Providencia.

BY MR. O'REGAN:

Q Captain, how do you check the work of your navigators?

A By comparison with the other fixes that were obtained in watches previously during the watches and my own personal bearings if so required.

Q In other words, you do check it --

A I do.

Q -- as a matter of course?

A Yes.

Q Part of the business of running a ship, correct?

A Right.

Q And how often do you check the fixes and the information on the charts set down by your navigators, I mean your watch officers?

A As a routine, at sea I check the morning celestial fix, star fix, noon position, which is a series of running fixes with the Meridian altitude, and the evening star fix.

Q What about the fixes as your vessel proceeds say from sunset to sunrise, do you have an occasion to check those fixes?

A Not often unless we are piloting.

Q Do you ever have occasion to refer to those fixes and determine whether or not they were properly laid out?

A Oh, yes, oh, yes, definitely.

Q Would you explain that, please.

A Well, in the course of supervising watches you check the bearings and the progess of the vessel along your track as you have laid down. Usually this is done with your navigating officer. I usually run at least a 24-hour track, and by comparison of one watch or one watch's fixes and the next watch's and the speed of the vessel, you can establish the accuracy or inaccuracy say of a fix.

Q In other words, after each officer is finished with his watch you as the normal course of your routine of being in charge of the vessel, you will check the fixes and the navigational points and references that those officers have laid out on the chart, is that correct?

A Fairly correct. I wouldn't necessarily say as a routine each watch. I might do it even during the watch or if it wasn't necessary would not do it every watch, but if it became necessary piloting in close waters,

naturally I would be checking it during the watch. 16

Q Captain, the officers you had on board your vessel on -- for the record, what is the date again?

A The 2nd of September.

Q -- on the 2nd of September 1973, do you have an opinion as to their competency?

A Yes, they were perfectly competent.

Q Do you know that from your own observation or is that just an opinion?

A From my own observation.

Q Do you have faith in their navigational abilities?

A Yes, sir, I do.

Q (Exhibiting chart to witness) Captain, I show you a chart which is designated "N.O. 26000," and I ask you if you can identify this chart for us, please.

A Yes. This chart that I am holding in my hand is I believe a duplicate of the chart that you are holding, Mr. O'Regan.

Q I see.

A And this is the Hydrographic Office. I will change that now, it is changed and changed again, but this one is actually labeled the Oceanographic Office, formerly the Hydrographic Office, and in the future it will be the Defense Mapping Agency, No. 26,000.

MR. O'REGAN:

Off the record.

(Discussion off the record.)

BY MR. O'REGAN:

Q Captain, the specific map that you are now viewing, would you tell us how that chart was used, if it was used at all, on board your vessel?

A Yes, this chart was used on a passage from Cristobal to New Orleans. This particular section covering an area on departure of the Cristobal breakwater, Panama Canal Zone, up to and including -- the last fix on there is 0400 which would be the 3rd of September, departure from Cristobal

being approximately 1400 on the 2nd. 18

Q Is the year 1973?

A 1973. All years of course being 1973.

Q Captain, can you tell us in your own words how that chart was specifically used on board your vessel?

A Well, this is a track that the navigator and myself laid out proceeding from Cristobal en route to New Orleans, and this particular track we decided on as being the safest and most prudent way to clear two dangerous shoal areas, specifically Roncador Cay, Serrana Bank, and -- three areas -- Quita Sueño.

MR. O'REGAN:

Let us mark this as an exhibit, "Captain McGinty No. 1," please.

(Whereupon, the chart referred to by Counsel was duly marked for identification as "Exhibit Captain McGinty No. 1.")

BY MR. O'REGAN:

Q Captain McGinty, at my request did you transfer the information contained

on McGinty Exhibit No. 1 for identification, to another chart? 19

A Yes, I did.

Q Would you please produce the chart on which you transferred the information.

A (Indicating) This is the chart.

MR. O'REGAN:

The captain has produced a chart, a British chart, Hydrographic Office of the Admiralty, No. 1218.

MR. KOSTER:

Of the British Admiralty?

MR. O'REGAN:

Yes.

BY MR. O'REGAN:

Q Captain, the chart which you have just identified for us, would you explain what the blue line indicates on that chart.

A The blue line is our track line as laid off exactly on the previous Hydrographic Office chart which is McGinty No. 1.

MR. O'REGAN:

Let's mark the second chart that the captain is now talking about as "McGinty Exhibit No. 2."

(Whereupon, the chart referred to by Counsel was duly marked for identification as "McGinty Exhibit No. 2.")

BY MR. O'REGAN:

Q Captain, referring to McGinty Exhibit No. 2 for identification, namely, the British Admiralty Chart No. 1218, you indicated that the blue line which you drew on that chart indicates your course, that is, the course of the PIONEER CRUSADER?

A Correct.

Q -- on September 2, 1973 while proceeding north, is that correct?

A Correct.

Q Captain, what do the green lines indicate on that chart?

A The green lines are a series of radio direction finder bearings that we procured en route from Cristobal on

the night of the 2nd and the morning of the 3rd of September 1973.

Q From what reference point?

A I don't think I understand that one. Reference point? The aerial beacon which is located on San Andrés Island.

Q I see. Now, were these bearings taken in the regular course of your ship's operating procedure?

A Yes, yes, they were.

Q Is that a standing instruction from you to your officers?

A Yes, in line with my general orders of using all navigational aids, and in this particular case it is a significant aid.

Q Why is that?

A Because the loran transmitting stations and the reception in this area are very poor, hence you have to rely on your next best bet which would be an RDF bearing and ultimately fixing the vessel with your radar on these various land masses.

Q But you consider RDF very important in this area? 22

A Yes, I do.

Q Captain, starting from the bottom of the green lines, I see a figure "1820-328°-118'." What does that indicate?

A This is the time, the first group "1820" is 1820 hours, the 328 represents 328 degrees as the bearing on the San Andrés aerial beacon, and the 118 miles was the range at which we obtained this bearing.

Q Do you know anything about the characteristics of the San Andrés aerial beacon?

A The characteristics?

Q Yes.

A I really don't recall what codes they signal. It is a standard aerial beacon. Actually it is a very good aerial beacon.

Q What do you mean by that?

A It is powerful and it has a very clear -- the reception on it is very clear, it is an excellent aerial beacon and

I believe it is used as a homing signal for aircraft approaching the Canal Zone.

Q Do vessels use it?

A Oh, yes, indeed!

Q Talking about seagoing vessels?

A Yes, indeed, it is a very important aerial beacon in this area.

Q Captain, moving upwards on the chart which we have identified as McGinty Exhibit No. 2, the next green line has figures over it, namely "2030-316°-65" -- and a mark over it which I assume is miles. What does that indicate?

A The same as the previous, the 2030 is 2030 hours, the 316 is degrees, and a range of 65 miles.

Q Does the same reasoning apply to all of the green lines and the figures marked thereon as we proceed north on McGinty Exhibit No. 2?

A Yes, exactly the same.

Q Captain, do you have an opinion as to whether or not the aerial beacon on

San Andrés is an efficient means of navigating when proceeding in this area?

A Yes.

MR. KOSTER:

Objection, objection, objection. I don't think there is any foundation for him to answer that question.

BY MR. O'REGAN:

Q Answer the question.

A Yes, I feel it is a significant aid.

Q In what respect, Captain?

A It has been my experience in this area that the loran lines are extremely unreliable. There is a lot of interference in signals, and generally we don't have too much success with loran in this part of the ocean.

Q Why is that?

A I really don't know, I think it is because of the atmospheric conditions over this ocean mass, probably something to do with the frequencies. It is a common occurrence on all ships that

operate with loran in this area. I am not expert on radio propagation, but this is --

Q You are referring to loran now?

A I am referring to loran.

Q Captain, the information which at my request you transferred from McGinty Exhibit No. 1 to McGinty Exhibit No. 2, is that information plotted as a regular course of your ship's business?

A Yes.

Q Would you explain that to us, please.

A Any bearing --

MR. KOSTER:

I object to the form of the question, "as a matter of the ship's regular business" you at Mr. O'Regan's request transfer information from one chart to another chart. I don't understand that.

MR. O'REGAN:

Mr. Koster, I am referring now to the information contained

thereon, I am not referring specifically to the transferring of the information from Exhibit 1 to Exhibit No. 2. 26

MR. KOSTER:

Then I think the question probably reads improperly.

MR. O'REGAN:

I will rephrase it.

BY MR. O'REGAN:

Q Captain, the information contained on Exhibit 1 which at my request has been transferred to Exhibit 2, is that information maintained and plotted on charts on board your vessel?

A Yes, it is.

Q -- in the regular course of your ship's business?

A Yes, it is.

Q Would you explain that to us, please.

A That is a standard requirement of the watch officer, any positions, lines of positions, bearings, et cetera be plotted on the chart that is in

use so as to fix the vessel along its track. It is a standard procedure.

Q Do you order your officers to do so?

A It is a standard operating procedure as ordered in my standing orders and also a normal procedure on any well run vessel.

Q And you check the information contained on --

A Yes, I do.

Q -- Exhibit 1, do you?

A Yes, I do.

MR. O'REGAN:

I have no further questions at this time.

CROSS-EXAMINATION

BY MR. KOSTER:

Q Captain McGinty, you testified you are next going to India. How long a voyage is that on the PIONEER CRUSADER?

A It will be approximately two months.

Q Is that to India or is that --

A No, to and return, the round trip will be

two months.

Q Captain, are you being compensated for your professional services here today?

A No, sir.

Q Have you often appeared as a witness?

A Very rarely.

Q Well, would you give me an estimate as to the number of times you have appeared as a witness?

A In court?

Q Either in court or at depositions or in any other official tribunal.

A Two occasions in court in my entire career, both in claims cases, once in the Federal Court in Boston, which was a longshoreman claim, and another was a crew member claim and it was in the Federal Court in Philadelphia.

Q Captain, have you ever sailed on a vessel that was not equipped with loran?

A Yes, I have.

Q Loran A or Loran C?

A Yes, I have.

Q Have you ever sailed on a vessel that didn't have an RDF on it? 29

A No.

Q Have you ever sailed on a vessel that did not have a Decca navigator aboard it?

A Yes.

Q Have you ever sailed on a vessel that didn't have a radar aboard it?

A Yes.

Q Have you ever applied for employment with Irish Shipping Company, Ltd.?

A No, I have not.

Q Captain, you emphasized that you have instructed your officers to use every means available to them in their navigation. Navigation is a question of judgment, isn't it?

A Navigation is a science or art.

Q Yes. The old navigation, sun navigation, is an art, not a science, a question of judgment not necessarily encumbered with mathematical certainty?

MR. O'REGAN:

I object to the form of the question.

Don't answer it.

BY MR. KOSTER:

Q Have you ever heard the expression navigation is an art, not a science?

A Yes, I have heard that expression.

Q Do you agree with it?

A No, I do not.

Q You think it is a science?

A No, it is not a science.

Q Can you elaborate a little bit further on the type of RDF equipment that you had aboard your vessel, the PIONEER CRUSADER? The model number?

A Somehow or other we have misplaced our notes. I did have the model number. It is a standard Radio Corporation of America model, I just cannot recall the exact serial number, et cetera, of the equipment.

MR. KOSTER:

Mr. O'Regan, will you determine what that is and provide us with that information, not necessarily today but at some point?

MR. O'REGAN:

Off the record.

(Discussion off the record.)

MR. O'REGAN:

Yes, I will.

THE WITNESS:

May I interrupt here? Also the copies of my standing orders were in this pile of papers which we seem to have misplaced.

BY MR. KOSTER:

Q Captain, when was your RDF last calibrated prior to September 2, 1973?

A On August 30, 1973.

Q Is that an automatic type set?

A No, it is not an automatic type set.

Q So it calls for operator training to read it, for the readings could vary depending upon the training of the operator?

MR. O'REGAN:

I don't understand that question. Would you rephrase it, please.

BY MR. KOSTER:

Q Operator judgment is involved in reading the machine, is that correct?

A I don't think it is as much judgment as it is experience.

MR. O'REGAN:

Mr. Koster, I am sorry. When you say operator, do you mean watch officers?

MR. KOSTER:

I mean the person operating the machine.

MR. O'REGAN:

Which in this case, Captain, would be the officers?

THE WITNESS:

The officers or myself.

MR. O'REGAN:

On watch?

THE WITNESS:

On watch, and myself.

BY MR. KOSTER:

Q Captain, am I correct that you did not take any of the readings on McGinty Exhibit No. 1?

A No, that is incorrect.

Q O.K. Would you tell me, perhaps identify them by the times, those that you

took and those that were taken by someone else? 33

A I was on the bridge and checked the 1900 star fix. Prior to that time I was on the bridge and tuned in on the aerial beacon on San Andrés Island at 1820, and I obtained the bearing which is so noted on McGinty Exhibit No. 1.

MR. O'REGAN:

And 2?

THE WITNESS:

And 2.

A (Continuing) And at this time I had done this to check the quality of the signal which was being transmitted from San Andrés and found it was an excellent signal.

BY MR. KOSTER:

Q Quality in terms of the strength of the signal or the accuracy of the bearing?

A Quality in regard to the strength, clearness, and the ability to get the null on the signal.

Q And this one that you took, this was before sunset?

A Yes, it was, approximately 40 minutes.

MR. O'REGAN:

Forty minutes?

THE WITNESS:

Prior to.

A (Continuing) Well, let me put it this way -- I will correct that -- it was approximately sunset because the stars -- being at 1900, which were done in the evening, twilight, which would be after sunset, so it was around sunset I would say, this signal, as close as I can recall.

BY MR. KOSTER:

Q Now, these bearings were taken I understand in conjunction with your having fixed your position by some other means?

A Yes.

Q And that other means -- well, those other means were either a celestial position at evening stars or radar range and bearing?

A Right, and you will see an occasional loran line which we managed to obtain.

Q Does loran have a tendency to wander at night?

A Yes, it does.

Q Captain, have you been through this area before?

A Yes, I have.

Q Have you ever transited that area relying solely on an RDF fix?

A No, sir.

Q Have you ever navigated extensively using a running fix on an RDF station?

A I have had to at times, yes, sir.

Q For what length of time?

A I can recall one occasion when we were in the English Channel when both our radar and Decca were down, inoperative, where we ran from Bishop's Rock to Antwerp.

Q This was with a pilot aboard?

A No, sir.

Q No pilot in the Channel?

A No pilot in the Channel and in reduced

visibility, and we had --

Q Captain, I think you have answered my question.

MR. O'REGAN:

May he finish?

A (Continuing) We had to rely on the RDF on this occasion. We had no other means, our Decca was down, and, as you know -- I don't know whether you know it -- they don't have any other electronic means in the channel.

BY MR. KOSTER:

Q Captain, these readings were taken in September of this year? I just want to confirm that.

A Yes, sir, September of 1973.

Q What was the weather on the night in question, September 2-3, 1973?

A Well, I have here a copy of a log sheet for September 2, 1973. I am quoting the entries on the 1600 to 2000 watch "mostly cloudy. Good visibility. Moderate following sea, sea and swell." On the watch from 2000 to 2400, "partly cloudy, good

visibility, moderate southeasterly following sea and swell." I don't have any copy of the morning of September 3. 37

MR. O'REGAN:

Let's mark it.

MR. KOSTER:

If you want to mark it as your exhibit, all right.

MR. O'REGAN:

I want to mark the log from which the captain has been reading.

MR. KOSTER:

If you want to mark it as your exhibit, fine. I don't care to mark it.

MR. O'REGAN:

I will mark it as "McGinty No. 3."

THE WITNESS:

I can have this returned? This is my ship's file.

MR. KOSTER:

Why don't you substitute a copy and deem it marked Exhibit 3.

MR. O'REGAN:

Would you mind if we Xeroxed it here and returned the original to the captain and let the Xerox be marked as Exhibit 3? Is that agreeable?

MR. KOSTER:

O.K.

(Whereupon, a Xerox of the original log referred to by Counsel was duly marked for identification as "Exhibit McGinty No. 3.")

BY MR. KOSTER:

Q Captain, do climatic and atmospheric conditions have an effect on radio signals or any electronic equipment that utilizes radio signals?

A Yes, they do.

Q Were there any heavy rain showers in the area the night you were there, September 2-3, 1973?

A Not that I can recall.

Q Captain, were you on the bridge at all that night? Or let me ask you this: when did you leave the bridge that night?

A I left the bridge at approximately 8:00 p.m. I had one call from the watch officer when they had made a radar bearing, a range on the Cayos del Este Sudeste.

Q Could you give me the approximate time of that, just approximately?

A (Referring to book) 2200.

Q Did you go to the bridge on that occasion?

A No, sir.

Q When did you go to the bridge?

A I did not go to the bridge.

Q When next did you go to the bridge following leaving the bridge at 2000?

A Approximately 6:00 o'clock the next morning.

MR. O'REGAN:

Excuse me. Captain, when you were answering the last few questions you were referring to a document. What is that?

THE WITNESS:

Night order book of the PIONEER CRUSADER.

MR. O'REGAN:

Let's mark the two pages that you are referring to as "McGinty Exhibit 4-A" and "McGinty Exhibit 4-B."

MR. KOSTER:

Off the record.

(Discussion off the record.)

MR. O'REGAN:

It has been agreed by the attorneys that McGinty Exhibit 4-A and 4-B marked for identification, Xerox copies will be deemed as the original exhibits for purposes of this deposition. Is that correct?

MR. KOSTER:

For purposes of this litigation.

(Whereupon, the documents referred to by Counsel were duly marked for identification as "McGinty Exhibit 4-A" and "4-B.")

BY MR. KOSTER:

Q Captain, do heavy rain squalls and showers have an effect on the efficiency of

electronic aids to navigation such as RDF? 41

A If I understand you, you mean the electrical storms that usually accompany squalls, rainstorms, in this area?

Q Well, let me divide the question in two then. Would an electrical squall have any effect?

A Yes, it would.

Q Would a nonelectrical squall have an effect?

A Unlikely.

Q Is this dependent in turn on the range and the position of the squall in relation to the receiver and the transmitter of a radio signal?

A No, I think it is in reference to your receiver on the ship, not the transmitter.

Q Captain, I note on McGinty Exhibit 1 that when bearings were taken on that aerial beacon that is located on San Andrés, the vessel was -- well, the vessel was generally abeam -- and I will define "abeam" as any-

where from 30 degrees forward of the beam to 30 degrees aft of the beam -- the vessel was certainly no more than 30 miles away?

MR. O'REGAN:

May I have that question read back, please.

(Whereupon, the pending question was read back by the reporter.)

MR. O'REGAN:

Mr. Koster, I don't want to interrupt your line of questioning, but I believe that there were bearings -- the original bearing as indicated on McGinty Exhibit No. 2 was taken at 1820 at Bearing 328 degrees at 118 miles.

MR. KOSTER:

Yes, but the vessel was not abeam at that point or anywhere near abeam.

MR. O'REGAN:

Are you referring to that bearing as well as other bearings?

MR. KOSTER:

No, I am just referring to the bearings that were taken when the vessel was relatively abeam of the island.

MR. O'REGAN:

You are now asking the captain were some bearings taken when the vessel was abeam of the aero beacon, is that your question?

MR. KOSTER:

Well, let me put it this way, referring to McGinty No. 2, the reading at 2230 and the reading at 2400, all of those were taken when the vessel was less than 30 miles. I suppose the exhibit speaks for itself but I am asking the captain.

THE WITNESS:

Those specific bearings?

MR. O'REGAN:

I don't mean to interrupt again, but you are talking now about mileage, you are not talking

about abeam. Abeam is a direction and mileage is distance, so would you rephrase your question, please. 44

MR. KOSTER:

Well, I don't see how I can rephrase it. I think the captain understands it.

MR. O'REGAN:

I don't.

BY MR. KOSTER:

Q The readings taken when the vessel was abeam of the island were all at a range when the vessel was less than 30 miles, is that true?

MR. O'REGAN:

Check it out, Captain. Off the record.

(Discussion off the record.)

A To answer Mr. Koster's question, I think the three bearings you are referring to, which were one forward of the beam, one abeam, and one abaft the beam, specifically 2230, 2330, and 2400 hours -- the one at 2230 was

29 miles, the one abeam at 2330 was 23 miles, and the one at 2400 was 30 miles. Does that answer your question, Mr. Koster?

MR. O'REGAN:

Would you check your last comment?

THE WITNESS:

2400 actually is 28 miles as corrected as compared to as it shows on Exhibit 2 as 30 miles.

BY MR. KOSTER:

Q So, Captain, aboard your ship no reading was taken at a range greater than 30 miles between 2230 and 2400, is that correct?

A Yes, that is correct.

Q Captain, would you compare the efficacy of aero beacons to marine radio beacons?

A I believe I understand what "efficacy" means, so I will have to answer probably in the vein of an opinion. I think an aerial beacon is far superior to a standard marine radio beacon.

Q An aero beacon is primarily designed to assist airplanes, is it not?

A It may be primarily designed to assist airplanes, but actually in my opinion it is a much clearer signal than a standard marine radio beacon.

Q Does this depend at all on what sort of land configuration might exist between the airport where the aero beacon generally is located near?

MR. O'REGAN:

Objection. I don't believe there is any grounds for your surmising that aero beacons are generally located by airports. If that is the case you can establish it.

MR. KOSTER:

O.K.

MR. O'REGAN:

I am not so sure it is on the record at the present time.

BY MR. KOSTER:

Q Does the efficiency of an aero beacon have anything to do with where it

is located on the land and what might be between it and the coast?

MR. O'REGAN:

I object. That is about three questions in one. If you rephrase it one at at time I would permit the captain to answer it.

MR. KOSTER:

I don't think it is hard to answer. Well, strike it.

BY MR. KOSTER:

Q Captain, are you familiar with this publication (exhibiting volume to witness)?

A This particular edition?

Q Dutton's in general.

A Dutton's in general, yes, I am.

Q And this particular edition?

A This is the seventh printing, July 1967. Yes, I am fairly familiar with this edition. I believe there is a copy aboard and I probably have referred to it. I am not entirely certain that this is the edition that we have aboard.

Q Captain, is this generally recognized as an authoritative treatise on navigation?

A Yes, it is.

Q I am going to ask you to turn to Page 237. There under Section 1406, heading "Errors," about halfway down there is a subheading "Night effect" in italics.

A Yes, I have the paragraph.

Q I will read this into the record, it is just a sentence. "Within half an hour of sunrise and sunset, and to a lesser extent throughout the night, radio bearings may be less accurate than at other times, due largely to polarization effect. This is manifest by a broadening and shifting of the minimum signal."

Do you agree with that?

MR. O'REGAN:

Object to the form of the question and direct the witness not to answer it.

MR. KOSTER:

On what grounds?

MR. O'REGAN:

The statement speaks for itself. The captain is here as a witness and has testified as to what has been physically observed by himself and by the officers on board his vessel. He is not here in the capacity of an expert witness to either agree or disagree with the statements made in Dutton's.

MR. KOSTER:

Off the record.

(Discussion off the record.)

MR. KOSTER:

Mr. O'Regan, I dispute your characterization of the witness. He has done something at your request. Whether he is simply a fact witness or not the Court will have to decide. Anyway I press on.

BY MR. KOSTER:

Q Would you look at that again, Captain.

MR. O'REGAN:

I am not directing him not to answer questions as far as radio direction finding and its usefulness, availability, et cetera, I am directing him not to answer your question which calls for a conclusion on his part as far as his comments as to a passage in the edition of Dutton which you have presented.

MR. KOSTER:

He has already testified that the use of this equipment requires judgment and that his determination of the competency of his officers requires judgment, and I think I am entitled to test his judgment.

MR. O'REGAN:

I certainly agree with that.

MR. KOSTER:

And I am doing that with respect to a respected treatise which he has acknowledged --

MR. O'REGAN:

I don't think you are, but proceed.

BY MR. KOSTER:

Q Would you look again at Page 237, Captain. There at the bottom under the heading "1407. Plotting radio bearings. -- radio bearings are plotted and labeled in the same manner as visual bearings. However, radio bearings are usually much less accurate and a position determined with the aid of one or more of them is generally called an estimated position and labeled EP. A new DR track line is not customarily run from an EP, but the course line may be plotted from such a position in addition to the usual track to determine whether or not there is a possibility of the ship standing into danger."

Now, do you agree that that is a standard practice, to label such a position EP and not generally draw a track line from it, or do you disagree?

THE WITNESS:

May I answer? I think I can answer.

MR. O'REGAN:

Sure.

A I disagree. In this particular case we were testing the reliability of this particular aid, and as you will see on my Exhibits 1 and 2, these bearings and positions obtained through other means of navigation, in the case of the 1900 position from stars, in the case of the 2237, the fix was a visual and a radar range, and these bearings compared in most cases favorably with positions obtained from other means of navigation.

Q Captain, do you know the sequence in which those positions were taken, the visual position and the RDF position? Was the visual position taken first and then the RDF taken? Have you any way of knowing?

A Yes.

Q Did your officers tell you?

A Yes. They are labeled with the time

(indicating).

Q Well, in other words, an RDF fix was taken at 2230 and seven minutes later a visual radar range was taken?

A Yes.

MR. O'REGAN:

Referring to McGinty Exhibit No. 2.

BY MR. KOSTER:

Q Is that the sequence that was generally followed?

A I think it varies. If you notice, my orders specified an hourly bearing on the aerial beacon and generally they fitted this in in the course of their watches, and as they were obtaining other fixes, they would miss because of the conflict of obtaining two fixes.

Q Captain, you pointed to a piece of paper here when you said "my orders." Does that relate to the RDF station on San Andrés?

A No, it does not. This --

MR. O'REGAN:

Let's identify that paper as "McGinty No. 5" for the record. 54

THE WITNESS:

Mr. Koster, this piece of paper which is now labeled as McGinty Exhibit No. 5 is a series of bearings obtained as a requirement by the Federal Communications Commission, simultaneous visual and radio direction finder bearings which were taken on Cape Mala beacon -- radio beacon that should read -- on the vessel's arrival at Balboa on August 30, 1973. This is an annual requirement by the Federal Communications Commission, that this be done, and in fact it was done on August 30, 1973 to comply with this requirement.

MR. O'REGAN:

Not to interrupt the captain or Mr. Koster's line of questioning, but I would like to read the

next sentence in the Dutton volume which Mr. Koster asked the captain to read.

MR. KOSTER:

To what purpose? Do you intend to ask questions about it?

MR. O'REGAN:

On Page 237 the next sentence which Mr. Koster neglected to read is, "A series of estimated positions obtained by radio and supplemented by a line of soundings can often fix the ship's position with considerable accuracy." This sentence was not read to the captain. However, it was contained in the paragraph which Mr. Koster referred to. Just for the record.

BY MR. KOSTER:

Q Do you know if on the night in question your officers took a series of readings and averaged them out for each one of the RDF fixes they took?

A No, they took a single RDF bearing.

MR. O'REGAN:
For the record, when you say "a single" you mean one reading at a time?
THE WITNESS:
One reading at a time.
MR. O'REGAN:
There is more than one reading --
THE WITNESS:
Right.
MR. O'REGAN:
On that exhibit, on those Exhibits 1 and 2?
THE WITNESS:
A series of bearings over a period from 1820 hours on the 2nd, and our last bearing was 0300 hours on the 3rd.
BY MR. KOSTER:
Q (Exhibiting volume to witness) Captain, I show you a publication generally referred to as Bowditch, specifically Hydrographic Office Publication No.9, and I ask you if you are familiar with this publication?

A Yes, I am familiar with this publication. 57

Q Is this a generally recognized text in the field of navigation?

A Yes, it is.

Q Captain, would you look at Page 314.

MR. O'REGAN:

Off the record.

(Discussion off the record.)

BY MR. KOSTER:

Q There at the top of the page under a subheading "Polarization error," it states: "As indicated in Article 1008, the direction of travel of radio waves may undergo an alteration during the confused period near sunrise or sunset, when great changes are taking place in the ionosphere. This error is sometimes called night effect. The error can be minimized by averaging several readings, but any radio bearings taken during this period should be considered of doubtful accuracy."

Do you agree or disagree with that statement?

A Generally I would agree with that statement.

Q Have you ever experienced this night effect?

A Yes.

Q And this is similar to what you referred to before in relation to loran?

A No, it is not.

Q Well, would you explain the difference?

A Not being technically competent, I will attempt to explain the difference between night effect of a bearing which is an RDF type of navigational aid, as against loran which is a pulse type of navigational aid. The night effect in the changes of the position of the ionosphere affect the pulse type in a time area. In fact, the loran of course is the measuring of the pulses whereas the bearing in the case of the RDF -- I don't think you can really compare both the errors. It is a different type of error, although the causes of this error might be the same, the

changes of the height of the ionosphere.

MR. O'REGAN:

Off the record.

(Discussion off the record.)

BY MR. KOSTER:

Q Captain, you explained the difference between what you regarded as night effect with respect to loran and that with respect to RDF, but you did say you have experienced night effect with respect to RDF. What is the effect of that on RDF, just RDF?

A Generally the night effect is the changing of the null in the RDF signal. The null is the actual minimum sound signal that you receive on which you take the bearing of the radio direction finder signal.

Q Captain, on the following page, Page 315, about two-thirds of the way down the page there is a paragraph that begins, "Radio bearings are plotted and labeled as any other bearing. If

it is desired to indicate the nature of the bearing, the word 'radio' might be added to the label, preferably below the line. Since radio bearings are generally somewhat less accurate than visual bearings, and often are observed at greater distances, positions obtained by them are generally considered of insufficient accuracy to be termed fixes, and so are usually considered estimated positions." 60

MR. O'REGAN:

Excuse me. Just let me read that to myself.

(Brief pause in the proceedings.)

BY MR. KOSTER:

Q Do you regard that as a sound practice?

A Yes, including the whole paragraph, the last sentence, "However, judgment should govern the reliance to be placed upon such positional information. A series of such positions may provide the basis for elimination of random errors, giving a

reliable fix unless systematic errors (Article 2903) are present."

BY MR. KOSTER:

Q Captain, a portion of the part that I quoted also stated "and often are observed at greater distances." The range has something to do with it then, does it not, the accuracy of the bearing?

MR. O'REGAN:

If you don't understand the question -- do you understand the question, Captain?

BY MR. KOSTER:

Q Does the range that an RDF bearing is taken from have anything to do with the accuracy of the bearing?

MR. O'REGAN:

What range are you talking about, Mr. Koster?

BY MR. KOSTER:

Q Is a range taken at 20 miles on an RDF station more accurate than one taken at 100 miles?

A Yes.

Q Captain, the start of the next paragraph in that same section on Page 315 of Bowditch reads: 62

"Some navigators estimate or assume a probable error (usually of plus or minus two degrees unless conditions suggest another value) and plot lines on each side of the bearing line to indicate the probable area within which the vessel is presumed to be located."

Do you agree with the tolerance suggested therein, plus or minus two degrees?

MR. O'REGAN:

Not to interrupt your line of questioning, Mr. Koster, but I think at this point I must interject the following:

The captain is here as a factual witness. He does have competency, obviously, as far as navigating and running a ship. I think we will all agree he is a most qualified skipper. However, your line of questioning

I believe is geared towards expert testimony and the captain is not here as an expert witness, he is here as a factual witness. You may proceed. When I say you may proceed, I mean I will not direct the witness not to answer questions. Certain questions, however, I do believe should be regarded as questions which would more properly be directed to expert testimony. The captain is here to testify as to what was observed by his vessel. The capacities of the San Andrés aero beacon and your references to various nautical editions I believe should be more properly directed to an expert witness. Not reducing in any way the captain's capabilities or capacities to govern, direct and navigate a ship and supervise the activities of his officers.

MR. KOSTER:

Off the record.

(Discussion off the record.)

BY MR. KOSTER:

Q Captain, what do you regard as the tolerable error in an RDF reading?

MR. O'REGAN:

What do you mean "tolerable error"? Would you be more specific?

MR. KOSTER:

Mr. O'Regan, that is one of the reasons why I have recited these noted nautical authorities, so the captain would see the references within which I am putting a context. The statement is here, "Some navigators estimate or assume a probable error (usually of plus or minus two degrees unless conditions suggest another value)." Does the captain figure the same error or some other error?

MR. O'REGAN:

I believe the documents to which you

refer, Mr. Koster, speak for themselves. The captain has testified as to what was recorded on the chart of his vessel, and I think his testimony is quite clear in that regard. 65

MR. KOSTER:

What is on McGinty Exhibit 1 and McGinty Exhibit 2 is the time 2230 hours, the station bore 285 degrees. Now, does that mean it could be 283 or 287 and somebody put down 285, or is it 285?

THE WITNESS:

It is 285 as they read the bearing.

BY MR. KOSTER:

Q As someone else read that bearing?

A As the watch officer on that watch read that bearing. He read it as 285 degrees and so plotted it.

Q Captain, am I correct, referring to McGinty Exhibit No. 2, that the last fix on here is a radar fix at 0200?

A This is a radar fix at 0200.

Q There is an 0300 RDF, but am I correct that this is the last radar fix?

A This is the last radar fix that we obtained.

Q And that radar fix would be on Isla Providencia I assume?

A On Isla Providencia Island or Old Providence. I think they both are one and the same.

Q Yes. So the 0300 DR is not based on a fix?

A Our 0300 is actually a DR position.

Q And the 0300 entry there, that is an RDF?

A This is an RDF reading, a bearing of 180-1/2 degrees, and at that time we were actually 86 miles by our 0300R position from the San Andrés aerial beacon.

Q Captain, does the effectiveness of an RDF station change depending on the quadrant that the ship might be in with respect to the station?

A It would vary depending on the location of your antenna system of your RDF,

the way your equipment was mounted physically on the vessel. If there was a large metal mass say blocking a quadrant of the RDF, you could possibly affect the efficiency of your system.

Q Captain, by the way, on the PIONEER CRUSADER what type of receiver do you have, the fixed loop or what type is it?

A It is the movable loop system.

MR. O'REGAN:

Off the record.

(Discussion off the record.)

BY MR. KOSTER:

Q Captain, you said earlier that these were dangerous shoal areas in here. If you weren't certain of your position east and west, would you proceed at all?

MR. O'REGAN:

Excuse me. That question "in here" and "dangerous shoal areas," what are you talking about, Mr. Koster?

MR. KOSTER:
Serrana Bank, Quita Sueño Bank, and Roncador Bank.
MR. O'REGAN:
Are you asking the captain are these places which have low water?
MR. KOSTER:
He has already characterized them as shoal areas.
MR. O'REGAN:
Those areas you are specifically referring to?
MR. KOSTER:
Yes.
MR. O'REGAN:
O.K.
BY MR. KOSTER:
Q If you were headed north and weren't sure of your position east and west, would you proceed at all?
MR. O'REGAN:
Objection. The captain is not here to testify how he should proceed or what, he is here to testify as to what was observed

on his ship's equipment. Don't 69
answer the question, Captain.

MR. KOSTER:

Mr. O'Regan, it seems to me you are impeaching your own witness's testimony. Everything that he has testified to is based on something that was done by somebody else. But if the witness is directed not to testify, I have no further questions.

MR. O'REGAN:

For the record, I don't believe my comment was -- well, it was certainly not directed to impeach the captain's testimony. If you can demonstrate to me how I have attempted to impeach it, I would be pleased to observe your comment and let him testify. You may continue, Mr. Koster, and ask the question again, but I just don't understand the relevancy of your asking the captain as to whether he agrees

with the charted depths of the water as indicated on Exhibit McGinty 2 for identification. I think the chart speaks for itself. If you were asking him as to how masters should proceed in this area, I will allow that if the captain has an opinion. 70

MR. KOSTER:

Well, I have stated the question. The captain has already testified as to his standing night orders and the desirability of relying on certain practices and certain types of navigational information, and I think he can certainly answer the question I asked him, if he is proceeding north in this area and not certain of his position east and west, what would he do.

MR. O'REGAN:

What area? That is what throws me off.

MR. KOSTER:

We have already defined that, through the area between the shoal water off the Mosquito Coast, Quita Sueño Bank and Serrana Bank.

MR. O'REGAN:

Are you asking the captain as he is proceeding as his ship did on this occasion or as another vessel may proceed between Quita Sueño Bank and Serrana Bank? You have got about two or three questions in one. What is your question?

MR. KOSTER:

It seems to me the question is fairly straightforward. If he is proceeding north in the area that is covered by this chart, McGinty Exhibit No. 2.

MR. O'REGAN:

Covering an area of how many miles?

MR. KOSTER:

The chart speaks for itself as

how many miles it covers.

MR. O'REGAN:

I agree.

MR. KOSTER:

If he is uncertain of his position east and west, what would he do?

MR. O'REGAN:

I object. That question has absolutely no foundation. What do you mean what would he do? He would proceed north I would assume.

MR. KOSTER:

Wait, wait. Do you agree --

MR. O'REGAN:

But the point is, I am not testifying and the question has no relevancy, so therefore I direct the captain not to answer the question.

MR. KOSTER:

O.K. I have no further questions.

MR. O'REGAN:

Fine.

For the record I would like to say one thing, and the reason for my objection is that Mr. Koster's question is so general as to leave me at a loss. I don't understand what you mean by "proceeding north." That is a generalization.

MR. KOSTER:

Generally I mean on a course of 000.

MR. O'REGAN:

If Mr. Koster would specify where the captain's vessel is at a specific time and proceeding on a certain heading, well, then perhaps the captain might be able to answer his question.

MR. KOSTER:

Mr. O'Regan, that defeats the entire question. By definition the question says he doesn't know where he is east and west but he is south some place of Quita Sueño Bank and Serrana Bank, in

that general latitude of 14 degrees north. 74

MR. O'REGAN:

Somewhere south. O.K. What is your question, Mr. Koster?

MR. KOSTER:

What would he do?

MR. O'REGAN:

Off the record.

(Discussion off the record.)

BY MR. KOSTER:

Q Can you answer the question, Captain? Well, you have been directed three times not to answer. Why don't we just leave the record the way it is?

MR. O'REGAN:

If you understand the question, Captain, feel free to answer it.

THE WITNESS:

Quite frankly, gentlemen, you have me confused. To answer the first part of the original question, do you consider these dangerous waters, my answer is very definitely yes, definitely yes. In

laying out this track with the navigating officer, Mr. Davis, we proceeded along this track specifically to fix our position prior to arrival off Quita Sueño and Serrana Bank. This was utilizing the aerial beacon on San Andrés and on radar, and this is why we did proceed along this track (indicating).

Q O.K. When you referred to the area that got you off Quita Sueño Bank, if you did not have a position at that point, what would you do?

MR. O'REGAN:

At what point, Mr. Koster?

MR. KOSTER:

He just pointed to the area off Quita Sueño Bank.

MR. O'REGAN:

When you say "area," I don't know what area you are talking about. You pointed to a chart identified as McGinty Exhibit No. 2. What area are you talking about?

BY MR. KOSTER:

Q Captain, did you not touch the pencil down here in the vicinity of latitude 14 degrees north?

A Which is the general area of the two banks, Quita Sueño and Serrana.

Q Yes.

A I am confused, I am confused. What are you getting at, Mr. Koster?

MR. O'REGAN:

Off the record.

(Discussion off the record.)

BY MR. KOSTER:

Q Captain, if for one reason or another you know that you are at latitude 14 degrees north going north on your vessel but you don't know what longitude you are at, you don't know where you are east and west, what would you do?

MR. O'REGAN:

Objection. Don't answer the question. You are not here as an expert witness as to what you would do, you are here as a

factual witness.

MR. KOSTER:

O.K.

MR. O'REGAN:

-- based on your experience in the running of your ship.

REDIRECT EXAMINATION

BY MR. O'REGAN:

Q May I ask this question, Captain: The track that you took, is that the only track -- in your experience is that the only track that masters take going north? To the best of your knowledge, do you know?

A To the best of my knowledge, no, that isn't the only track.

Q All right.

MR. KOSTER:

No questions. That is it.

MR. O'REGAN:

One more statement on the record. When I say a factual witness, Captain, I am talking about with reference to RDF and navigational aids and things of

that sort, I am not specifically referring to your general expertise in the area. If Mr. Koster would like to go into that further, he certainly can feel free to do so. 78

MR. KOSTER:

Well, I made several attempts. We have to stop some place. You keep saying the same thing four different ways.

MR. O'REGAN:

At the risk of repeating myself, you may ask further questions if you like.

MR. KOSTER:

I have no further questions.

MR. O'REGAN:

O.K. That is it.

(Whereupon, the document previously referred to by Counsel was duly marked for identification as "Exhibit McGinty No. 5.")

....Thereupon, at 4:10 o'clock p.m., the taking of the witness's testimony was concluded....

C E R T I F I C A T E

I, Helen R. Dietrich, do hereby certify that the above and foregoing is a true and correct transcription of the stenographic (Stenotype) notes of the proceedings herein, taken down by me and transcribed under my supervision, at the time and place hereinbefore noted, in the above-entitled and -numbered cause(s).

I further certify that the witness(es) was duly sworn by me in my capacity as Notary Public in and for the Parish of Orleans, State of Louisiana; that I am not of counsel nor related to any of the counsel or any of the parties, nor in the employ of any of them, and that I have no interest in the outcome of this action(s).

Helen R. Dietrich

REPORTER & NOTARY

DEPOSITION OF PAUL ALLEN GREGWARE

Master of the "American Courier" (Ex. J)

BENJAMIN REPORTING SERVICE 5 BEEKMAN ST.

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF NEW YORK

----------X

In the Matter of the

Complaint of IRISH SHIPPING, LTD., Plaintiff, as Owner of the SS "IRISH SPRUCE," for exoneration from or Limitation of Liability.

----------X

DEPOSITION of PAUL ALLEN GREGWARE, taken pursuant to Notice, held at the offices of Bigham, Englar, Jones & Houston, Esqs., 99 John Street, New York, New York on the 11th day of January, 1974 at 2:00 P.M., before Irwin H. Benjamin, a Notary Public of the State of New York.

BENJAMIN REPORTING SERVICE
5 Beekman Street
New York, New York 10038
374-1138

APPEARANCES:

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Attorneys for various cargo claimants
99 John Street
New York, New York
BY: FRANCIS O'REGAN, ESQ.,
of Counsel

o0o

IT IS HEREBY STIPULATED AND AGREED by and between the attorneys for the respective parties hereto that filing, sealing, certification and signing be and the same are hereby waived.

IT IS FURTHER STIPULATED AND AGREED that all objections, except as to the form of the question, shall be reserved to the time of the trial.

BENJAMIN REPORTING SERVICE 5 BEEKMAN ST.

P A U L A L L E N G R E G W A R E, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. O'REGAN:

Q State your name and present home address for the record, please.

A Paul Allen Gregware, my home address?

Q Yes.

A Mill Island, Georgetown, Maine.

Q Captain, after you testify today, where do you intend to go?

A The first of the week, down in Florida, and from there, San Francisco to pick up my ship, and then out.

Q When you say and then out, where do you expect to go with your ship?

A Back to Vietnam.

Q When do you expect to pick up your ship?

A In April, the latter part of April.

Q And how long will you be making a run to Vietnam?

A Six months.

Q Captain, by whom are you presently employed?

A United States Lines.

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Q In what capacity?

A Master.

Q Are you on your leave period at the present time?

A On my leave period, yes.

Q And are you master of any particular vessel?

A The AMERICAN COURIER of the United States Lines.

Q Do you presently hold a license issued by the United States Coast Guard?

A Yes.

Q What license is that?

A Master, unlimited.

Q Is it RADAR-endorsed?

A Yes.

Q How long have you held the license?

A Just about ten years.

Q Have you attended any maritime schools?

A Maine Maritime, that is in Castine, Maine.

Q Is that a four-year school?

A At that time, it was a three-year school.

Q Can you tell us about your sea-going experiences to date?

A I have been with United States Line approximately

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25 years.

I first started out on cargo vessels, and then from there, I went to passenger ships. I was on passenger ships eight to ten years, and from there, back to the freighters, to my present position as master aboard this vessel.

Q Have you been master of any other vessels besides this one?

A Yes, the AMERICAN ACCORD, which is a container ship, and another vessel, similar in class that I am on, the AMERICAN -- I can't think of it right now.

Q Have you ever --

A AMERICAN RELIANCE.

Q Have you ever operated radar yourself?

A Yes.

Q As a navigational aid?

A Yes.

Q Have you ever operated Loran as a navigational aid?

A Yes.

Q Have you ever operated RDF, radio directional finder, as a navigational aid?

A Yes.

Q What type of vessel is the AMERICAN COURIER, Captain?

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A It is a cargo vessel. It is CHALLENGER type class. It is 461 feet length overall, 11,600 gross.

Q Is it equipped with radar?

A Yes.

Q What type?

A It is equipped with radar, RCA.

Q And Loran?

A Loran, low.

Q And does the vessel have RDF?

A Yes.

Q What type of RDF?

A RCA.

Q And was the AMERICAN COURIER equipped with this gear on the 29th of August, 1973?

A Yes.

Q Were you on board the vessel on that date?

A Yes.

Q Did you make a voyage?

A Yes.

Q From where to where?

A From Panama Canal up to New Orleans.

Q Captain, do you have any practice on board your vessels as master with regard to the use of radar,

BENJAMIN REPORTING SERVICE 5 BEEKMAN ST.

Loran, and radio directional finder for navigating?

A I just tell all the officers that serve with me to use all the navigational aids that we have to help on the situation that we are encountering at the time.

Q Do you also utilize celestial navigation?

A Yes.

Q Is it common to check one means of navigation against the other?

A Yes.

Q And the information obtained?

A Yes.

Q Was that done during your voyage on August 29 and 30, 1973?

A Yes. We used all our navigation aids from Panama up to New Orleans.

Q You mean all the navigational aids which you could use?

A Yes, Loran, radar, RDF, as far as in the morning.

Q How is the responsibility, the responsibility for navigation while on watch, delegated to your officers?

MR. KOSTER: Just note my objection. In due course, I will object to all this on the grounds of relevance.

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A Pardon?

(Record read.)

A Well, each watch, I pass the word on to the officers during the night, what I expect from my watch officers during the night. As far as stars, and navigational aids, to help us to find out where we are. Plus I want to be called at all times, when we are approaching land or anything unusual, or I want to be called, and I also write up night orders, tell them what I expect of the officers during this particular time.

Q Did you at any time supervise the navigation by your officers?

A Yes.

Q What did you do?

A I check it all, like Loran, RDF, and things like that.

Q Would you explain a little bit more in detail by you check it out?

A Well, with Loran, I take a fix myself, and check with theirs, and I also do the same thing with RDF, and check the chart at the same time.

Q So, from time to time, on your voyage of August 29 and 30, 1973?

A Yes.

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Q Captain, do you have an opinion as to the competency of the officers on board your vessel on that date?

A I had good officers on that date.

Q Did you have faith in their navigation?

A Yes, I did. I learned that for the length of time I have been going with them.

Q Captain, are you familiar with the beacon located on San Andrews Island?

A Yes.

Q Do you know the strength of that beacon?

A One thousand.

Q One thousand watts?

A Yes.

Q Do you know whether it is a continuous signal?

A It is continuous.

Q Have you ever used it yourself?

A Yes.

Q Captain, I show you this chart. NO 26,000, and ask you if you can identify that for us?

A The Island?

Q No, the chart, what is it?

A It is an HO chart 2600, the chart that I use from

BENJAMIN REPORTING SERVICE 5 BEEKMAN ST.

Panama to go up, to start my route up to New Orleans.

Q Was that on the voyage we are talking about, namely August 29?

A Yes.

Q Leaving Cristobal.

A Yes.

MR. O'REGAN: I ask this chart be marked Gregware Exhibit 1 for identification.

(Chart referred to was marked Gregware Exhibit 1 for identification.)

Q Captain, was this chart kept in the regular course of your ship's business?

A I don't understand. What did you say?

Q Was this chart kept, and the markings thereon, in the regular course of operating your ship?

A This was the way I did it, yes, going out to New Orleans.

Q And you ordinarily use a chart similar to this?

A Yes.

Q When navigating?

A Yes.

Q In various parts of the world?

A Yes.

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Q Captain, at my request, did you transfer certain information contained on Exhibit 1 to this chart, which I now place before you, which is Chart British Admiralty 1218?

A Yes.

MR. O'REGAN: I ask that be marked Exhibit Gregware 2 for identification.

(Chart No. 1218 was marked Gregware's Exhibit 2 for identification.)

Q Captain, referring to Exhibit 2, could you tell us what the various lines leading from San Andrews Island indicate?

A These are the bearings and radio bearings that we took on board the vessel on August 29, between myself and the officers, as we were going up this way to New Orleans. Each one of these lines represent the bearing from San Andrews, and it tells you the bearings of 330, and also the hours that we took each one of these bearings.

Q Captain, I refer you now to Exhibit No. 1, and I note on that exhibit that there is a bearing for2200, is that bearing contained on Exhibit 2?

A Exhibit 2, we have it down here, but it is -- you can't get the fix on there, because the chart is not

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large enough.

Q I see. Who took the bearing at 2200?

A I was on the bridge at the time. Myself and the officers, we all took the bearings and we checked them out together at various times throughout the route, that I was on the bridge taking bearings with my officers, checking them out, and plotting it with them.

Q To the best of your recollection, can you tell us which bearings you took or checked out with your officers?

A Oh, around 2200, 0100, and two, and around the morning star time.

Q Captain, I note that a bearing was taken at 2200, and again at 2300; was the combined information used for any purpose?

A It was a running fix, which I used RDF all the way through, and gave me my position.

Q So using the information contained from the 2200 bearing and the 2300 bearing, you ran a running fix, is that correct?

A That is correct.

Q And was that done at any other time thereafter?

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A All the way up through, I used it, and from the 2200 bearing, all the way through to star time, and beyond. It checked in, and the overall average over the RDF, up through there, put us right with the stars, and also the Loran when we could get it; also checked with the RDF.

Q Captain, you say you yourself took some bearings on San Andrews beacon. How did these bearings come in, were they good, were they poor?

A At the beginning of it, it was a little bit, 200 miles, over 250 miles, they didn't really start coming in good until ten o'clock, where I was getting good fixes.

Q Is that 2200?

A That is my first good one, yes. The others were coming in nice, strong and clear, and would tell you which side of the bow it was on, and things like that. But from 2200 on, it was coming in very good.

Q Did you have any difficulty picking up the strength, say at 150 miles?

A She was good up to 150 miles.

Q You say a star fix was taken at 0600 on the morning of August 30, is that correct?

A That is correct.

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Q And is that indicated on Exhibits No. 1 and No. 2?

A Yes.

Q On Number 1, is it the dot with the circle, just south of the area, Serrana Bank?

A Yes.

Q And how did your running fixes compare with the information obtained from your star fix?

A Very good. They proved out just about as accurate as the stars were.

Q You say you took some bearings yourself after the morning star fix, is that correct?

A Yes.

Q Which ones did you take, to the best of your recollection?

A I started taking them right after around eight o'clock, started taking up there until around eleven, off, and on through those hours.

Q And how did those readings come in?

A They checked in very good; back to the stars, and also between each one of them.

MR. O'REGAN: I have no further questions at this time.

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CROSS EXAMINATION

BY MR. KOSTER:

Q Captain, are you being compensated for your professional services in testifying here today?

A I believe so. I haven't really discussed it with anybody, but I believe I am.

Q Do you know Captain Patterson of U. S. Lines?

A Yes, I do.

Q Do you know Captain McGinty of U. S. Lines?

A I have never met him, but I know of his name, yes, sir.

Q Do you know of Captain Lowell of U. S. Lines?

A Yes, he is a classmate of mine.

Q Have you ever appeared as a witness before, Captain?

A Not in something like this, no, sir.

Q In what have you appeared as a witness?

A When a seaman gets hurt, he fell in a crow's nest.

Q How long are you in New York at the present time?

A I plan to leave Wednesday for Florida.

Q How long have you been here?

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A I just came in, just about two days.

Q And you are next going to Vietnam eventually?

A I believe that is where the ship will be going, around -- with the military, with MSC.

Q With what ship would that be?

A My own ship, the AMERICAN COURIER.

Q When you return from Vietnam?

A I will be on the ship actually for six months, it will be two trips, in and out. That is the way they had been running the last few years.

Q Have you ever worked for Irish Shipping Company, Ltd.?

A No. I never ran across the Irish ships, to be honest with you.

Q Captain, have you ever sailed on a ship that was not equipped with Loran?

A Way back when I first started to sea, yes, sir.

Q Have you ever sailed on a ship that was not equipped with RDF?

A No, sir.

Q Have you ever sailed on a ship that wasn't equipped with a Decca navigational navigator?

A Yes, we had one on our ship, but they took it out, because there is no Decca out that way.

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Q Have you ever sailed on a ship that was not equipped with radar?

A No.

Q Captain, all those four things that I have just mentioned are aids to navigation, are they not?

A Yes.

Q Is a radar any good as an aid to navigation, if you are in mid-ocean?

A Yes, sir, when there is other ships around, with fogs --

Q As an anti-collision device, but not as an aid to navigation?

A It is an aid, actually, to navigation; when you come to other ships, you keep the hell out of the way.

Q Captain, you said the RDF on the AMERICAN COURIER was an RCA, do you know the model?

A Yes.

Q Could you give us those?

A The model number, RCA AR 8714.

Q Is it a relative or a true RDF?

A You can have both on it, sir. We use it true.

Q How did you use it on the night that you are testifying here about today?

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A True bearings.

Q When was it last calibrated?

A I really can't say exactly, when it was last calibrated, the other captain who relieved me did it from the time I was off, and you would have to go back and get the record of the ship.

Q When last before August 29, 1973, you don't know?

A I really don't know the date that he did it, no, sir.

Q Do you have a calibration table on the ship?

A Yes, sir.

Q You don't have that with you today, do you?

A No, sir, I didn't know anything about this case. I didn't know I was coming off.

MR. KOSTER: Mr. O'Regan, I request that you request United States Lines to see if the calibration table is available from the time that this voyage was made, and produce it, if possible.

MR. O'REGAN: I will make the request, yes.

Q What type of antenna did the RDF aboard the AMERICAN COURIER have?

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A Rotating antenna.

Q Rotating antenna?

A Yes.

Q How old was the set, by the way?

A I would say approximately ten years, I believe.

Q Were the readings that you took on the night in question, August 29-30, 1973, the RDF readings, were they taken in conjunction with other navigational information?

A The only thing I really had to do with it, you know, leaving Panama, when I left, in the breakwater, and I had one Loran fix.

Q Where is that Loran fix?

A Around almost at one o'clock in the morning.

Q Did you obtain any radar fixes on your way up?

A Radar fixes, no, sir.

Q Did you see the light on Roncador Island?

A I didn't see anything, sir.

Q At the time that you passed near Roncador Island, about 0500, who was on watch at that time?

A The four to eight watch, that is the second mate, or myself was up there.

Q You were up there?

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A Yes, sir.

Q Did you sleep at all on the night of August 29 and 30?

A I laid down, I have a master headquarters on the bridge, our own bedroom and everything.

Q Can you recall at what point you were sleeping on the night in question?

A Well, approximately, I was on the bridge, I would say, I was up there ten o'clock, getting that fixed, and after midnight, I laid down, and got up around an hour late, you can't sleep until you get by the point, and I was on the bridge taking those, and I stayed on the bridge until we got past the San Andrews Island. You can always tell in going by, by taking the bearings, whether she is right on the head or abeam or after the beam, so when she got abaft the beam, I laid down and got up before stars, until we made the turn; and that was right up until noon.

Q Captain, in using a RDF set, is operator judgment or skill or experience involved?

A In using the RDF?

Q Yes.

A Each person that does read it, naturally no two people are going to be the same, because every set

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has its own familiarities, but you can get good bearings any one person, that is why I was on the bridge checking them out, to see how close we come together.

Q Captain, on Exhibit 1, were some of the RDF bearings taken at night?

A This is all night, sir, except at the stars, that is daylight, and the rest were day time.

Q What time was sunrise, do you recall?

A Well, stars are there at six. I would say daybreak would have been probably around 5:45.

Q So, everything after, well, 0545 would have been after daylight?

A Say six o'clock. This is from here on, it would have been daylight, going up.

Q Captain, what were the orders that you gave your officers so far as the RDF was concerned. I take it some of those were not taken by you?

A No. Because after you work with them, a few of them with my office, you know how good they are.

Q That is --

A The people who are taking them.

Q That is not my question, Captain?

A I am sorry.

Q What did you ask your officers to do that

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night with respect to the RDF?

A I told them to take bearings with the RDF every hour, and when I was on the bridge, certain of these times, especially passing San Andrews Island, you can see that we took bearings a lot more, because I was on the bridge at least 75 or 90 percent of the time going through there.

Q Were any RDF bearings taken that were not plotted on Exhibit 1?

A No, sir. They are all there.

Q So far as you know?

A Yes, sir.

Q You can't testify that an officer didn't take one in your absence and not plotted?

A That is true.

Q Captain, have you ever heard of the --

A Excuse me, I am trying to think back there. You got on your stars -- you have your -- don't type that.

(Discussion off the record.)

Q Captain, have you ever heard of the phenomena called "night effect "?

A What?

Q Night effect?

A I thought you said chorometer.

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Q The answer is yes?

A Yes.

Q What do you understand that to be?

A I understand when you are taking like, I presume you are referring to your RDF, just before sunrise and sunset, there is a little difference in your readings on the RDF; which they say.

Q Have you ever experienced this?

A No, sir.

Q You have never experienced the phenomena of night effect?

A I didn't get any when I was coming up through.

Q Captain, you said they started coming in good at 2200 hours?

A They were coming in good long before that, but it was over 200, 250 miles. As far as getting a more accurate reading, I was right there taking it with them, they didn't seem to get that good too far of a range.

Q Captain, have you ever heard of a phenomena called "land effect"?

A Yes.

Q And what do you understand that to be?

A I believe it is depending where the locality of the station is, due to the mountains or the surrounding

area. It may be in a weather ship at that time, they might get an echo off the land or something.

Q Captain --

A I am not an expert on it, but that is what I believe.

Q Captain, you told Mr. O'Regan that you understood the beacon on San Andrews to be a continuous beacon or that you knew it was.

You mean by that, that it is reported to be a continuous beacon?

A No, I was up all night long, and --

Q But you don't know if any other day it was on or off?

A It says on the book it is continuous.

Q So it is reported to be continuous?

A Yes.

Q Captain, what is quadrantal error with respect to a RDF?

A That is when we -- that is for the errors on the compass when you check this between the radio bearings, and the true bearings of the vessel; between the station and the known object.

Q And this is what results in the preparation of a calibration schedule?

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A Yes, sir.

Q And did you on the night that you transited this area apply a correction for quadrantal error?

A No, sir.

Q You didn't?

A No, sir. Our chart doesn't have any; I mean, nothing to speak of.

Q Did you on the night that you were transiting this area, apply a conversion angle correction to the readings that you obtained from the RDF?

A No.

Q Captain, did climatic or atmospheric reception affect reception on an RDF?

A It didn't affect me at all coming up through here. I haven't had any.

Q What was the weather like on that night?

A It was partly cloudy, a nice night.

Q No rain squalls in the area?

A You have slight, but nothing that -- no thundering or anything like that.

Q No electrical storms?

A No, sir.

Q Would that affect RDF?

A Yes.

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Q Captain, normally, aboard ship when you complete a voyage, if nothing unusual has happened, you would erase your charts, wouldn't you?

A Yes, this one here is already erased. You can see, sir, we go from here to New York. This is the first time that I am making this run from Panama to New Orleans. I have never been that way before, but you can see the line from here, it goes up to New York, and it is erased.

Q Referring to Exhibit 1?

A Yes.

Q Captain, all the lines on this chart, Exhibit 1, are lines that you drew?

A I drew some of them, but mostly my officers did, I was standing right there with him.

Q Can you tell me which ones you drew?

A Offhand, I was around there drawing in them, around 2300, in that area, and up around one or two, and in the morning.

Q Captain, referring to Exhibit 1 --

A I can't exactly say where, no.

Q The heavy inscribed line with the arrow near it, reading 353, was that your track line?

A Yes, sir.

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Q Do you draw that on the chart before you start your voyage?

A Yes, sir.

Q And then you measure where you are in relation to it later on?

A Excuse me, off the record.

(Discussion off the record.)

A Yes.

Q Captain, I notice that 0100 your fix, if that it be, is to the east of your track line?

A Yes, sir.

Q Did you interpret that to mean your vessel as being set to the east?

A Well, you have current here on both sides, setting, and in my record, I had between one and two degrees on to the ship coming up through to allow for the set. But the overall picture, between the RDF bearing from one side to the other, the overall average put it right on the line.

MR. O'REGAN: You mean the course line?

THE WITNESS: The course line, yes.

Q But you didn't rely solely on RDF?

A No.

Q You had a Loran and star fixes?

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A The Loran is not perfect in this area, and I only got one Loran fix, so actually, I navigated up with RDF, except when I got to the morning stars, which proved out everything perfect.

Q Incidentally, Captain, near the time of morning stars, referring to Exhibit 1, at time 0600, where was your RDF line, at 0600?

A Right there.

Q And that is indicated on the chart RDF 0600?

A That is correct.

Q The other area near the tip of an arrow, with a number 173 behind it, is that your 0600 fix?

A Right where the circle is.

Q How far was that RDF line off your fix?

A How far off the --

Q Yes.

A Very close. These are the ones that are coming up, here is 0500 RDF.

Q Captain, you had a fix at 0600?

A Yes.

Q You also had a RDF line. Now, there is a distance between the two?

A Yes.

Q What is that difference?

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A The difference is approximately five miles.

MR. O'REGAN: Measure it off, Captain.

A Four miles.

But the overall picture, you can see, with the Loran --

Q Capt[illegible] there is no question.

MR. [illegible]REGAN: Wait for the questions, Captain.

A I thought you were asking the same question.

Q Captain, do you agree that the accuracy of an RDF on any given fix should be taken in the context of at least plus or minus two degrees?

A With plus -- within one or two degrees.

Q Does the variation or the degree of accuracy of a RDF depend upon the distance of the vessel from the transmitter?

A True.

Q In other words, the closer you are, the more accurate it would be?

A I presume that is right. It was up higher to 150 miles, on this particular case.

Q Captain, is it normal practice to label a RDF line, a position or a fix base there on EP, for estimated position?

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A No, sir.

Q Do you distinguish it in any way from another line of position, say a visual sighting?

A I don't -- would you want to repeat what you are trying to say?

Q Do you label a RDF position in any special manner?

A Just like I do, the time and the bearing of it.

Q Captain, in a running fix, if one line of position is inaccurate, the result is going to be an inaccurate fix, is it not?

A That is correct.

(Recess taken.)

BY MR. KOSTER:

Q Captain, you testified that in your office here in New York, this was the first time that you ever heard of the case.

Back in August, you prepared this chart, didn't erase a track line. At whose direction did you do so? Did you prepare the chart?

A Why I prepared the --

Q Why you kept it rather than erase it.

A I didn't know what it was about, and a friend of mine who wrote me to do this for him was Captain Patterson,

he didn't tell me anything about the case, and I thought that he -- I sailed with him for such a long time. He was always a bug on things like this, on the ships, that we sail with, and I thought he had some kind of a problem, so that is the reason. I have known him for years.

Q A problem with RDF?

A That or something else. I really didn't know anything about it, sir.

Q Captain, what caused you to choose this particular route in proceeding from Panama to the Gulf?

A Well, there are many ways you can go up there, and that was about the -- instead of going around the belt over there, and around the other way, east or west, I took right up straight, and split the middle.

Q Have you made this trip before?

A No, sir, this was my first time.

Q Captain, you had a fix at 0600, a star fix, so you had a departure point where you passed through the area, between Quita Sueno Bank and Serrana Bank. That is true, isn't it?

A Yes, with the star fix.

Q And I believe you told me you did not see the

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light on Roncador?

A Oh, no, sir.

Q Why was that?

A What?

Q Why didn't you see it?

A Not bright enough, not sharp enough, and it was a nice clear day. I couldn't see it, sir.

Q It was daylight by that?

A No, but it was a clear evening.

Q Did you see the light on Serrana Bank?

A No, sir.

Q And why was that?

A That was daylight there, I couldn't see it. It was clear.

Q I gather you passed within about eight miles?

A That is correct, sir.

Q Do you know what the characteristics of that light are, the physical structure of it?

A That was not offhand, not right now, but I believe, the light, I should have seen it at seven or eight miles, if I remember offhand, but I did not see it.

Q Did you obtain any radar ranges or bearings to either Roncador Bank?

A I didn't pick up anything, sir.

Q Did you attempt to?

A Yes, I had the radar on, yes, sir.

Q And you didn't pick up the light on Serrana Bank, even though it was less than ten miles away?

A No, sir. There was nothing on the charts to even indicate that I even saw it. There is no position.

Q You didn't pick up any radar return from Roncador Bank, even though you passed about ten miles away?

A Nothing, sir.

Q Did you attempt to pick up either of those?

A Radar was on continuously, all the way from Panama Canal all the way up.

Q Let me correct the record. My question suggested that Roncador Bank was past a distance of ten miles, it was actually 20 miles.

Captain, why are there so many RDF bearings that were taken on the night of August 29-30?

A As I stated to you previously about a couple of minutes ago, that Captain Patterson, again, asked me, I didn't know what the story was, as I told you, he is always a bug for things like this, so I thought I would do the best I could.

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Q And --

A I sailed with him, I didn't want the senior captain jumping down my back.

Q You took them much more frequently than every hour, did you not?

A When we got up closer to San Andrews, yes, sir, I would have taken at other times, if I really didn't know where my vessel was, I would have taken them a lot more oftener, every 15 minutes, so you would definitely know where your ship is, with the familiarity, each officer has would come out, and I would have gotten a better fix, than I did. As they were, I got them very good.

Q Captain, is the Loran line plotted on Exhibit 2?

A On Exhibit 2, no, sir.

Q Where is that Loran line on Exhibit 1?

A Over here.

Q And was that taken on what station, Captain?

A It was on this one here. Wait a minute.

Here it is, 3-H-1, is one of them.

Q 3-H-1 --

A It would be different, but I am giving you the 3-H-1.

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Q And what else?

A That would be it. 3-H-1, and the other one would be this one here, this green one, whatever you see the number 3-L-5.

Q The lines for both of those stations run basically north and south, don't they, on an angle?

A Here, you can see it here. It is not a bad cross. But the Loran down here, it isn't very good, and this is about the only one I could get, so I had to rely on the RDF going up through.

Q But the Loran fix gave you an indication of your position east and west, did it not?

A East -- it gave me a position where the vessel was, whether it was east or west of the track, yes, the same as my RDF, it did the same thing, where they are, this comparison. Very close.

Q If you would compare one, 0100, and 0048, how far are they apart?

A About five miles.

Q Would you check it, please?

A The Loran is only good for five miles, within five miles, they tell you in the book. More than that -- it is about seven miles; which is very good, because it tells you either side, east or west.

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Q Does it say anything in the book about RDF, Captain?

A RDF? Off hand, I can't rightly say. As you stated before, it is within one or two degrees. And also it depends upon the signal from the station, and everybody reads it differently, that is why I was on the bridge checking it out with them, to make sure that they were good.

MR. KOSTER: I have no further questions.

(Whereupon, at 3:00 p.m., the deposition was concluded.)

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BENJAMIN REPORTING SERVICE 5 BEEKMAN ST.

STATE OF NEW YORK)
) ss:
COUNTY OF NEW YORK)

I, IRWIN H. BENJAMIN, Notary Public of the State of New York, do hereby certify that the foregoing deposition of Paul Allen Gregware, was taken before me on the 11th day of January, 1974.

The said witness was duly sworn before the commencement of his testimony; that the said testimony was taken stenographically by myself and then transcribed.

The within transcript is a true record of the said deposition.

I am not connected by blood or marriage with any of the said parties, nor interested directly or indirectly in the matter in controversy, nor am I in the employ of any of the counsel.

IN WITNESS WHEREOF, I have hereunto set my hand and seal of office at the County and State of New York, this 24th day of January, 1974.

IRWIN H. BENJAMIN
NOTARY PUBLIC-STATE OF NEW YORK
No. 41-5262300 Queens County
Term Expires March 30, 1974

BENJAMIN REPORTING SERVICE 5 BEEKMAN ST.

DEPOSITION OF LLOYD DAVID LOWELL

Master of the "American Champion" (Ex. N)

678ω

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	72 Civ. 3199 (MEF)
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, -against- S.S. IRISH SPRUCE, her engines, tackle, etc., -and against- IRISH SHIPPING LTD., Defendants.	72 Civ. 656 (MEF)

DEPOSITION of CAPTAIN LLOYD DAVID LOWELL, taken by Cargo Claimants Sprague & Rhodes Commondity Corp., et al., before Harvey B. Kramer, Notary Public of the State of New York, held at the offices of Bigham, Englar, Jones & Houston, Esqs., 99 John Street, New York, N.Y., on the 11th day of October, 1973, at 3:00 P.M., pursuant to Notice.

BORAK REPORTING SERVICE
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APPEARANCES:

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New York, New York 10006
BY: JOHN C. KOSTER, ESQ.,
of Counsel

* * *

IT IS HEREBY STIPULATED AND AGREED by and between the parties hereto through their respective counsel that sealing, certification, filing and signing shall be and the same are hereby waived;

IT IS FURTHER STIPULATED AND AGREED that all objections except as to the form of the questions shall be reserved to the time of the trial.

* * *

L L O Y D D A V I D L O W E L L, having been first duly sworn by the Notary Public, was examined and testified as follows:

EXAMINATION

BY MR. O'REGAN:

Q What is your full name?

A Capt. Lloyd David Lowell.

Q Where do you reside?

A 547 Prinston Street, New Milford, New Jersey.

Q How long do you expect to be in the area?

A I expect to leave, I believe, Saturday for the Far East and I will be out of the country approximately two months.

Q Are you presently employed?

A I am on a leave of absence from the United States Lines Incorporated.

Q Are they your general employer, though?

A Yes, I work for United States Lines.

Q How long have you been working for them?

A Approximately twenty-two years.

Q Do you happen to hold any mariner's licenses?

A Yes, I hold a U.S. Coast Guard license for master, unlimited.

Lowell

Q Is it radar endorsed?

A Yes.

Q How long have you held this license?

A Approximately twelve years.

Q What maritime schools, if any, have you attended?

A I attended the Maine Maritime Academy in Castines, Maine.

Q Is that a four-year school?

A At that time it was only three. I graduated in 1950.

Q Would you tell us something about your seagoing experience from the time you graduated?

A I sailed for 13 months with the Navy after graduation from the Academy. After that I was released to inactive duty and I worked for United States Lines for the last twenty-two years.

Q In what capacity?

A From junior third officer all the way through to master.

Q On October 5th, 1973, what vessel were you serving on?

A I was relieving master on the AMERICAN -- on the SS AMERICAN CHAMPION.

Q Is that a United States Lines vessel?

A That is a United States Lines vessel under charter to the Military Sea Lift Command.

Q And were you master of that vessel?

A Yes, I was.

Q Did there come a time when the vessel sailed from Cristobal, Panama North?

A Yes, we left, took departure, took Cristobal breakwater about seven o'clock on October 5th, on a passage from Cristobal to New Orleans.

Q Have you been in command as master of other vessels besides the AMERICAN CHAMPION?

A Yes, I have.

Q Which vessels?

A I was captain on the AMERICAN COURIER and I was also captain on the AMERICAN LANCER.

Q Have you ever operated radar as a navigational aid?

A Yes.

Q Would you tell us in your own words on what occasions, roughly?

A Well, whenever possible. Whenever -- whenever I deem it advisable to use radar, I use it.

Q Have you ever operated Loran?

A Yes, I have.

Q Do you consider radar and loran effective means of navigation?

A Yes, I do.

Q Have you ever operated RDF, that is, radio direction finder?

A Yes, I have.

Q Do you consider RDF an effective means of navigation?

A Yes.

Q Have you ever used fathometer for navigational purposes?

A Yes, I have.

Q What type of vessel is the AMERICAN CHAMPION?

A Well, our company calls it a Challenger I Class. And it is a fairly modern ship, it is approximately ten years old. And it is five hundred -- approximately five hundred sixty feet long with a seventy-five foot beam.

Q Is it equipped with radar?

A Yes.

Q What type of radar?

A I believe the manufacturers are RCA.

Q Is it equipped with loran?

A Yes, it is.

Q What type?

A I believe that is manufactured by M. Low. I believe it is spelled L-o-w.

Q Did the vessel have a radio direction finder?

A Yes.

Q What type?

A It had an RCA radio direction finder.

Q When you are acting as master of a vessel, do you have any practice as far as using radar, loran and RDF for navigating?

A Well, I always believe in using all the equipment at hand if it is applicable, so all the navigational aids on the ship, if it is applicable at the time, we operate all of them at the time as near as possible.

Q Do you convey that order to your officers as a rule?

A Yes.

Q Do you also employ celestial navigation?

A Yes.

Q Is one means of obtaining navigational information checked against the other as a normal routine?

A Yes, whenever it is celestial and say radar fixes, we do cross checks and we do fixes and cross-check whenever possible.

(Continued on next page.)

Q Do you issue any orders to your officers regarding procedures for navigating while at sea?

A Yes.

Q What are those orders, specifically the orders that you gave to the officers of the AMERICAN CHAMPION?

A When there are no visual bearings as aids to navigation, why obtain celestial fixes, radio direction finding bearings, if possible, in that area, and turn the fathometer on if we are in an area where there are soundings, and to use loran if there are -- if we are in an area where we do have loran coverage.

Q How is the responsibility for navigating delegated to your officers?

A Well, of course myself being the master, why, responsibility of navigation of the ship is mine. But the second mate, he is our navigating officer, and he is responsible to make sure the charts are kept corrected and of course at night he is on four-to-eight watch and in the morning he is taking star fixes, and of course your star fixes are the two most important positions you fix your vessel with during the day.

Two third officers, one being on the eight-to-twelve watch in the morning and the other on an eight-to-twelve

in the afternoon, they are taking lines of position and advancing these lines of position for running fixes, and they are under my orders to take, first of all, the second mate's orders to take star fixes, which is common practice on all U.S. Line ships, and of course the third officers are required and told by me to take sun lines every hour on the hour in the morning, weather conditions permitting, and the same way in the afternoon, sun lines in the afternoon every hour on the hour, weather conditions permitting.

MR. KOSTER: I object to all of this on grounds of relevance. Just note my objection.

Q Is the navigational information obtained by your officers transferred to the chart that you have in use at the time?

A Yes.

Q Is this done in the regular course of your ship's business?

A Yes.

Q What is your practice, if any, in connection with supervision of your officers' navigation?

A Well, I go up and check, check quite frequently, on the positions they are obtaining, checking the charts.

Q To check their work?

A Check their work.

Q How do you do this?

A Well, just go up and observe the positions that they lay down on the charts. And if they are obtaining radar distances and bearings, why, I check the radar - myself and possibly put my own position down on the chart.

Q Do you also check the RDF bearings?

A And I go up there and check my RDF bearing. I take an RDF bearing and I compare mine with what the third or second officer may have taken.

Q On the trip that the AMERICAN CHAMPION was on on October 5th, 1973, did you specifically check the work of your navigators?

A Yes, I did.

Q Would you tell us what you did?

A Well, when we took -- most of the time it was celestial navigation, and plus the use of radio direction finding bearings. And I did turn the radio direction finder on myself and take several bearings and see how they compared with the ones taken by my ship's officers.

Q What did you take the radio direction bearings on?

A On St. Andrews Island.

Q How did the bearings that you took compare to the bearings taken by your officers?

A Mine were quite close to theirs, or theirs were quite close to mine.

Q Referring to the officers on board the AMERICAN CHAMPION on October 5th, 1973, do you have any opinion as to their competency?

MR. KOSTER: Objection as to relevance.

A Well, I believe that they were -- after observing them for about 15 days, I thought they were quite competent.

Q Did you have faith in their navigation?

A Yes, I did.

Q You said that you yourself took some RDF bearings on St. Andrews Island aerobeacon. Do you have an opinion as to the strength of that aerobeacon?

A Well --

MR. KOSTER: Objection. I don't see any foundation on which he could base an answer to that question.

A We took an RDF bearing on it approximately 0900 hours ship's time, andit was about -- I guess about 180 miles away.

Q How did it come in?

A Well, of course, it was just a first bearing so we had no way to check it at that particular time. But later on it proved within reasonable accuracy.

Q Do you know whether the St. Andrews Island aerobeacon is a continuous signal or not?

A Yes, it gives off a continuous signal.

Q Captain, I show you a chart, N.O. 26,000 and ask you if you can identify it for us.

A Yes, this was a chart that I used between Cristobal and coming up on Serrana Bank.

Q This is on October 5th?

A October 5th, 1973, on the AMERICAN CHAMPION.

Q Starting from Cristobal which is in the southeran part of the chart, would you tell us what the various symbols and numbers indicate?

A Right. At -- first of all, we come to an 0900 here, with a D.R. afterwards, after it, and that stands for dead reckoning position. That means we stepped -- we took our speed which we estimated as 23 knots and that should have been roughly our dead reckoning position at 0900. Then at 0900 we took a sun line, line of position, and also we took an RDF bearing here at 0900, and the line that has the little arrowhead on it is the RDF bearing.

Q That is the line with the arrowhead --
A Pointing towards St. Andrews Island.
Q At the top of that line it says, "324°." The bottom says 0900.
A Right.
Q And underneath the numbers 324° are the letters RDF; is that correct?
A Right, that is correct. So that was the 0900 position. Then we come up to the 1000 position, which once again is almost the same thing. Sun line at 10:00 o'clock and RDF bearing at 10:00 o'clock.
Q The RDF bearing again being the line pointing in the direction of St. Andrews with an arrow on it with the number 1000; is that correct?
A Right, that is correct.
Q Please continue, Captain.
A Then we had an 1100. Once again, another sun line at 1100 and an RDF bearing at 1100.

Then at noontime we have advanced our sun lines here, 23 knots, and we took an RDF bearing also on St. Andrews Island at noontime, and we took a latitude sight a little after 12:00, I forget the exact time, a little after noon. And we stepped that back to 1200 position and we established a noon position for the vessel.

Just a little bit, maybe a mile and a half to the right of the course line, 353 course line.

Q Please continue, Captain.

A After noontime, we encountered rain squalls. At 1300 we have a 1300 position here which consists of an RDF bearing taken on St. Andrews Island, and our latitude line advanced, and also one sun line. Our 11:00 o'clock sun line advanced.

And at 1400 we have a position here which is a sun line, and once again an RDF bearing taken on St. Andrews Island, still showing the ship a little to the right of the course line and a little behind our 1400 dead reckoning position.

At 1500, once again we have a sun line and an RDF bearing on St. Andrews Island, and showing still the vessel just a little bit to the right of the course line.

At 1540 we have a sun line and at 1600 an RDF bearing was taken, and at 1600 the RDF bearing didn't check in as well as it should with our position, but we were encountering some static on the RDF, radio direction finder.

At 1618 we took -- by this time the second officer has come on the bridge and relieved the watch and he took a sun line to establish the position and also together

we took an RDF bearing, he and I both. That shows the ship almost on course line.

Q This is the --

A At 1618. And a little bit behind the 1618 dead reckoning position.

At 1700, we received the -- the auto-alarm went off, which signifies a vessel in distress or maybe aircraft in distress, and the radio operator had to disconnect our antenna on the radio direction finder in order to check on this distress message.

It proved to be a false alarm. Later -- however, we did have some incoming messages so we still stayed on watch to copy the incoming messages, so that was the last RDF bearing we took.

Then later on here at 1830 we took -- my second officer got a star fix and a star fix shows we are approximately five miles to the right of course line.

Q Let me ask you a question now, Captain.

The information which you just provided us with, this is all recorded on the chart N.O. 26,000 which you used in navigating; is it not?

A Yes.

MR. O'REGAN: I would like to have this chart marked as Cargo Claimants Lowell Exhibit 1

for identification.

(Chart referred to above marked Cargo Claimants Lowell Exhibit 1 for identification, this date.)

Q Captain, is Exhibit 1 a chart which you would normally require your officers to maintain in this fashion in the regular course of your ship's business?

A Yes.

Q In other words, the navigational information you do require to be plotted on this chart?

A Right.

Q Captain, at my request did you transfer information from Exhibit 1 to British Admiralty Chart 1218 which I now place before you?

A Yes. I did.

MR. O'REGAN: I ask that British Admiralty Chart 1218 be marked as Cargo Claimants Lowell Exhibit 2 for identification.

(Document referred to above marked Cargo Claimants Lowell Exhibit 2 for identification, this date.)

Q Captain, can you tell us what the weather was from the time you left Cristobal until the time you

took your last RDF bearing on St. Andrews light -- I'm sorry -- aerobeacon?

A From 7:00 o'clock in the morning to noontime it was partly cloudy. The wind was back on the starboard quarter approximately south-southeast, maybe, oh, about ten to twelve knots.

Then after noontime, why, between 12:00 and 2:00 P.M. we experienced considerable cloudiness with some rain squalls.

And then from approximately 1400 until -- well, 1400 on it was cloudy to partly cloudy and the wind was still back there at about south-southeast, ten knots or so, and visibility was good after 1400 again all the way up past Serrana Bank.

Q Captain, based upon the information which is contained on Exhibit 1, if you were on a vessel such as the AMERICAN CHAMPION, that course, and your radio direction finder was the only means you had to navigate, would you rely on it?

MR. KOSTER: I object. I object to the form of the question. He had more than the RDF to rely on.

A Yes, I would rely on it.

Q Did you consider the information which you

obtained on October 5, 1973 from the RDF bearings taken on St. Andrews Island to be in general accurate?

MR. KOSTER: Objection.

A In this particular case, they worked out quite accurate, using them as a running fix. They established my position within a reasonable -- well, they just established the vessel's fix to my satisfaction using it as a running fix.

Q Do you have an opinion as to the reliability of information obtained using RDF and St. Andrews aerobeacon?

A Would you please repeat that again?

Q Sure. Do you have an opinion as to the reliability of information obtained from bearings taken on St. Andrews aerobeacon?

A Well, in this particular passage it proved -- it proved accurate.

Q Captain, on Exhibit 2, would you tell us what the line leading from St. Andrews aerobeacon, above which the figures are 0900, 343 degrees dist., 178 miles, represents?

A That means that is the radio direction finder bearing to the island and it is actually 324.

Q What did I say?

A I don't know. Anyway, 324, and the "dist." means distance, and the 178 miles means distance; if the ship was on a course of 353, that was the distance from the aerobeacon or the radio direction finder station at the time.

Q And would the same apply to all the other lines and the information contained thereon? Those lines I am now referring to are the ones extending from the aerobeacon. In other words, the time, the bearing, and the distance of the vessel from the aerobeacon?

A Right.

Q Is that what those lines represent?

A That is correct, from 0900 through 1700.

Q And the other information contained thereon, the fixes, and so forth, is also information extracted, taken from Exhibit 1 and placed on Exhibit 2; is that correct?

A To the best of my knowledge, yes.

MR. O'REGAN: No further questions at this time.

(A brief recess was taken and the deposition resumed.)

EXAMINATION

BY MR. KOSTER:

Q Captain, are you being compensated for your professional services in your giving of testimony here today?

A I believe so.

Q Do you know Capt. Patterson of the United States Lines?

A Yes, I do.

Q Do you know Capt. McGinty of United States Lines?

A Yes, I do.

Q Have you ever appeared as a witness before in any sort of proceeding?

A Yes, I have.

Q In what capacity? To give advice to the court or as a fact witness to the subject matter of whatever that litigation might have been?

A What do you mean, advice to the court?

Q Well, did you testified as an expert or did you testify as a witness?

A Witness.

Q How many times was this?

A Oh, approximately four times, I think.

Q Where was this testimony given? Before a Coast Guard board of inquiry or a court or an arbitration?

A It was just like here, with a court stenographer and several lawyers.

Q What was the nature of these instances of litigation?

A Longshoremen injuries, mostly. Let's see, yes, it was all longshoremen injury cases.

Q I believe you testified, Captain, that you go to the Far East next and that that voyage is two months in length. Do you know what you will be doing after that?

A Vacation.

Q How long is that vacation?

A About two months.

Q So you should be back about the end of the year and then you will --

A I hope to be back about December 15.

Q Captain, have you ever been employed by a company called Irish Shipping Company Ltd.?

A No.

Q Have you ever applied for employment with them?

A No.

Q Have you ever sailed on a vessel in your experience, Captain, that did not have a loran facility aboard?

A Yes.

Q Have you ever sailed on a vessel that did not have an RDF aboard?

A No.

Q Have you ever sailed on a vessel that did not have a DECCA navigator aboard?

A Yes.

Q Have you ever sailed on a vessel that did not have a radar?

A No.

Q When you were asked by Mr. O'Regan, do you consider radar, RDF, fathometers, effective means of navigation, you answered yes.

Captain, is radar any good in mid-ocean?

A Yes.

Q Apart from anti-collision, is it any good for navigation in mid-ocean?

A Not unless there are any islands around in order to find what your distance bearings are.

Q Captain, would RDF be any good if you were

operating in an area where there were no radio stations or transmitting areas, signals?

A If there were no signals coming in, it is obvious that your direction finder is of no use.

Q Captain, would the fathometer be of any value to you if you were in an area where the depth of the water was over, say, three miles?

A Over three miles? No. Of course, if you are in the Navy, that is something else again. Navy ships, yes; normal merchant ships, no.

Q What is the age of the RDF set that was aboard the AMERICAN CHAMPION; do you know?

A The ship itself is approximately ten years old and so I would say that the RDF unit was approximately ten years old.

Q Does it give the operator a relative or a true bearing?

A It gives the operator a bearing which is almost true. There are certain corrections that have to be applied.

Q But it is what would be termed a true bearing RDF rather than a relative bearing?

A That is right. It is -- it has a general compass repeater built into it so you do get a true gyrocompass

bearing.

Q Prior to October 5, 1973, when was your RDF last calibrated on the AMERICAN CHAMPION?

A In September '73.

Q Do you have a schedule that indicates the various corrections?

A There was one. There was one aboard the ship. The ship has just undergone an FCC, Federal Communications Commission, inspection, and a new certificate has been issued to the ship, and of course radio direction finder came under the inspection. And the previous captain had submitted a letter to the FCC showing and stating the different built-in errors that had to be compensated for on different -- when the ship -- well --

Q I think I understand what you mean, Captain.

Do you have that letter with you or the information that it contains?

A No, I don't.

MR. KOSTER: I call for the production of the letter that contains the corrections that must be applied to the RDF equipment that is in use.

MR. O'REGAN: I will make the request of

United States Lines.

Q Captain, what type of antenna was the RDF equipped with?

A Well, that is a little bit out of my domain.

Q Was it a fixed antenna or rotating?

A Yes, a fixed antenna. Fixed.

Q I believe you testified that your readings were taken in conjunction with information you received from other means, either celestial or by radar or anything else.

A That is right.

Q Captain, using an RDF, is operator skill and judgment involved?

A To a certain degree, yes.

Q Captain, I think you testified that you compared readings that you obtained with those of your officers and that in general the results were quite close. How close is "quite close"? One degree, two degrees, three degrees?

A One degree, and the fact is that I took my bearing maybe about several minutes after my deck officer took his, so naturally no two people are going to get the same reading.

Q Were any of these bearings that were indicated

on Exhibit 1 taken at night?

A No.

Q Are you familiar with a phenomenon called "night effect"?

A Yes.

Q Would you describe what you understand that term to mean?

A Well, they claim that radio signals around twilight, at night, and also in the morning, aren't as accurate or possibly your signals aren't as strong as they would be under daytime conditions.

Q You say "they claim." Have you ever experienced that to be the case?

A Well, yes.

Q Captain, did you make any attempts to use the RDF station in St. Andrews either before dawn or after dark?

A No.

Q Captain, have you ever heard of the phenomenon called "land effect"?

A Yes.

Q Would you describe what you understand that expression to mean?

A When a radio signal travels over land it may be

distorted and there is no -- as far as I know at this particular time, there is no way to compensate for the distortion.

Q Captain, what is quadrential error in relation to an RDF?

A Quadrential error is -- well, it is, because of certain magnetisms built into the ship, the RDF bearings we receive from a station would be distorted, possibly incorrect. And that's why we swing the ship and check it on RDF stations, taking visual bearings and RDF bearings simultaneously both with the cargo booms up and with the cargo booms down so we can establish how much this built-in error is and actually compensate for it, making certain compensations inside the radio direction finder itself, and then even by making these corrections there is always a certain amount of residual error still left in there, maybe anywhere from -- it depends on the individual ship, but it might be from a half degree dead ahead to several degrees by the time you reach a beam bearing, or back on quarter, for instance.

Q The information that you would get from swinging the ship or from testing the quadrential error would be then put on a compensation card and thereafter used whenever the RDF is used?

A And posted right by the RDF.

Q Do you have the compensation card that was in effect during the voyage you made on October 5, 1973?

A No.

MR. KOSTER: I call for the production of that. It may very well be the same as the previous item requested but I request them both if they are different.

MR. O'REGAN: Off the record.

(Discussion off the record.)

MR. O'REGAN: Again, Mr. Koster, I will ask United States Lines if they would provide us with copies, with a copy of the card to which you refer. These items, of course, are not in our custody or control or in the custody or control of any party whom we represent in this party, but I will make the request to United States Lines.

BY MR. KOSTER:

Q Captain, do climatic and atmospheric conditions have an effect on the reception of radio signals?

A Yes.

Q During an electrical storm, for instance, would that have an effect?

A Yes.

Q You said that your vessel passed through squalls on the voyage that commenced on October 5. Were these electrical squalls or were they not?

A Yes, there was some lightning and thunder.

Q Much?

A Well, let's say normal for the Caribbean. Nothing unusual, let's put it that way.

Q Did it affect your RDF reception?

A Yes.

Q In what respect?

A Well, we took an RDF bearing at 1300 and there was static and the signal was a little weaker, and we had a little broader null than we had experienced earlier.

Q Captain, translating that, does that mean that the bearing wavered more?

A The bearing itself may not waver, but the radio signal may have --

Q Well, Captain --

MR. O'REGAN: Let him finish the answer.

MR. KOSTER: Okay.

A Let's see how I want to put this. Off the record.

MR. O'REGAN: Stay on the record.

A The radio signal itself, from where I could receive the loudest signal, to where I could receive no signal at all, had increased to approximately ten degrees, which is a null. And previously we had maybe five degrees null at maximum earlier in the morning.

Q So in other words, on that reading that was taken during the squall, your confidence as to exactly what it was had to be placed within the framework of ten degrees?

A Right.

Q Captain, in your service aboard ships, when you finish a voyage, if nothing unusual has happened, you normally erase the charts, don't you?

A My second officer does, yes.

Q You use them over again?

A Yes.

Q But you didn't erase this one.

A No.

Q Captain, referring to that chart, if you would, Exhibit 1, what, if any, lines on there did you draw?

A What, if any? Let's see, I believe the 0900 RDF bearing the third officer took. I believe I put that one on.

Q The third officer took the reading, but you inscribed the line on the chart?

A I inscribed the line. And I don't recall if I did any others there, and the 618 line here, I did the 618.

Q 1618?

A 1618, I am sorry, 1618. And some of them that are labeled RDF, I put the RDF. They put the actual lines on but I labeled it RDF, just for my own information.

Q Captain, just so I have it clear in my own mind, this chart covers an area or a section of your voyage that you proceeded on from 0900, that being the first -- I am sorry --

A From 0700.

Q From 0700 leaving Panama on October 5, 1973, up through -- well, tell me, Captain, is this all October 5?

A Yes.

Q The entire day?

A Yes.

Q During the course of that day were you on the bridge from time to time?

A Yes, quite frequently.

Q What times, Captain, if you recall?

A Well, I can't say what times, but I was up there quite frequently.

Q I take it you were on the bridge when the vessel left the Canal Zone area?

A Yes.

Q Did you stay on the bridge most of the morning?

A No.

Q You left the bridge during the morning?

A Yes, during certain periods of time.

Q And did you go to lunch?

A Yes.

Q And that's not on the bridge?

A No.

Q Were you up there in the afternoon?

A Yes.

Q Were you up there more often than you were someplace else,"up there" meaning up on the bridge?

A No, I wouldn't say more often.

MR. O'REGAN: When you say "bridge," do you mean bridge area, pilot house, chart room?

MR. KOSTER: Yes.

Q Did you go to dinner?

A Supper?

Q Supper.

A Right.

Q That is not on the bridge?

A No.

Q Were you on the bridge in the evening?

A Oh, yes.

Q On what occasions?

A I was up there from the time I finished my supper until after we passed Serrana Bank.

Q Referring to Exhibit 1, there is, I take it, a star fix at 1830?

A Yes.

Q Did you get any RDF signals after that?

A No.

MR. O'REGAN: You mean did he take any? Is that what your question is?

MR. KOSTER: I said did he get any and he said no.

THE WITNESS: We didn't take any. So therefore --

Q Was there a reason for that?

A Yes.

Q What was the reason?

A At 1700 the auto-alarm went off for distress. After that, after we established there was no distress, we had several messages coming in and the radio operator stayed on watch and copied those messages.

Q Tell me, Captain, if you know, of course, why it is that the RDF would have to be disconnected during an emergency on the radio?

A It is the way our radio transmitting station is set up in conjunction with our RDF antenna. He changes the antennas over so that our RDF is more or less inoperative. If it is a real emergency, why, sometimes in between messages we shift -- in case I do want a position or something or an RDF bearing, we can shift back and forth for a short period. But in this particular case I thought the position was established well and so I didn't.

Q Captain, between 0900 and 1930 was your vessel at all times on the same course and speed?

A Until 1930? It was on the same speed, but not on the same course.

Q Could you tell me what your courses and speed were during the course of October 5?

A Our dead reckoning speed was 23 knots, and it later

proved out about 22.7 knots.

Q Captain, by dead reckoning speed, you mean that is the speed you were using to project a dead reckoned plot?

A Yes, right.

Q 23 knots?

A Yes.

Q And what was the course, courses?

A Our course -- one course we steered was 353. We held that all the way from 7:00 o'clock in the morning until 1900 hours.

Q So from 7:00 o'clock until 1900 you were on a course of 353 degrees true at a speed of 23 knots?

A That is correct.

Q Captain, you spoke before about quadrential error. Do you know whether the correction for this error was applied to the readings that were taken during the course of October 5?

A Yes, it was.

Q What is the basis of your knowledge that it was?

A Because I personally asked each officer as they laid their bearings down if they had applied it and

they showed me the original bearing obtained and the correction on a sheet of scrap paper.

Q Captain, have you ever heard of a conversion angle correction?

A Yes, I have.

Q Do you know if that was applied?

A Yes, I do.

Q Was it?

A It was applied.

Q What is the source of your knowledge that that correction was applied to each reading?

A Once again, that was one of the corrections that was shown on the sheet of pap[illegible]o me by my ship's officers, and of cour[illegible] at navigation table No. 1 the book was open on the table for that and they were applying it.

Q So when an operator uses an RDF, he has a form or at least a scrap of paper on which he makes various calculations giving him what he then interprets to be the angle-- the bearing, excuse me, that shall be plotted on the chart?

A That is correct.

Q Do you have those scraps of paper?

A No.

MR. KOSTER: I call for production of those scraps of paper as exhibits.

MR. O'REGAN: Do you know if they exist anymore?

THE WITNESS: No, they don't. I mean, I know they don't exist anymore. They are memo pads.

MR. O'REGAN: They don't exist.

THE WITNESS: No.

Q Captain, do you agree that the minimum accuracy of an RDF station at any given reading would be plus or minus two degrees?

A I can't say. I don't know. I don't agree, no.

Q You do not agree with that?

A No.

Q Captain, when Mr. O'Regan was asking you questions, you said later on the St. Andrews station readings proved to be within reasonable accuracy. What is "reasonable accuracy," one, two, three degrees?

A I don't go by degrees. You run the RDF bearings up for a running fix. In this particular case, probably the results showed a small triangle and they corresponded quite close to our celestial navigation running fixes and our star fix. So --

Q Well, again, Captain, however you define "reasonable accuracy" or "quite closely," define it for me.

MR. O'REGAN: I think the Captain has indicated what he means by "quite closely." I don't know what more you want. He said they corresponded to the celestial fixes.

Q In that case, give me an example, if you have one, that corresponds to a celestial fix, and what is the distance that it differs from it by?

A Oh, well, let's take -- well, here is a 1300 running fix here where we plot our latitude sight in and our 1300 RDF bearing, and we ran our 11:00 o'clock -- see, we advanced our 11:00 o'clock RDF bearing up as well. And it shows the ship just a little bit to the right of the course line, maybe a mile, the same as our 1200 noon fix, celestial fix, did, crossing three zone lines and a latitude line and also it checks in quite well speed-wise with a dead reckoning speed of -- let's see -- dead reckoning speed there -- it shows in this case, oh, about 23.8 knots. That shows just a little bit fast, right? I know the ship was not making 23.8 knots.

So -- but all in all, I consider that it established

the ship quite well, the ship's position quite well.

Q Does variation in an RDF signal or the degree of accuracy of the signal depend on the distance the receiver is from the transmitting station?

A I am no expert on RDF. I can't say.

Q Would you assume that it would be less accurate at 100 miles than at 10 miles?

MR. O'REGAN: Objection. The Captain said he is not an expert in RDF.

MR. KOSTER: I am perfectly willing to disregard all his testimony then.

MR. O'REGAN: You are asking him questions that I believe should be answered by an expert.

He can answer the question.

MR. KOSTER: Fine. Let him answer the question.

Q Would you assume --

MR. O'REGAN: My objection stands.

Q -- it would be less accurate at 10[illegible] miles than at 10 miles?

A It would be less accurate, true, not only the strength of the signal, but also in human error, because one degree, just by maybe getting a bearing off one

degree at that long a distance from the station could influence your position and your thinking.

Of course, if you ran them up over a period of several hours, all of that would all average out and it wouldn't make too much difference. But it could.

Q Captain, are there two kinds of sources of transmitters for use by an RDF, both a marine radio beacon and an aerobeacon?

A Would you say that once more, please? Please repeat that?

Q Are you familiar with a marine radio beacon?

A Yes, I am.

Q And are you familiar with an aerobeacon?

A Yes.

Q They are two different types?

A Right.

Q Both are used by an RDF?

A Yes.

Q Is one preferable to the other in your experience?

A No.

Q Do you know if there is a difference in accuracy or in strength or power?

A Well, different stations have different powers, so you have to specify. I mean, some stations are stronger than others, radio signal-wise.

Q Captain, have you ever heard of a recommended practice that a plot based on an RDF bearing is normally labeled an "EP," estimated position, rather than called a fix?

A Yes.

Q You are familiar that that is recommended as a practice by certain authors?

A Oh, yes.

Q Do you do that?

A No.

Q You do not regard it as an estimated position?

A Well, I regard it as an estimated position, but I don't label it EP necessarily on the chart. In this particular case, we put arrowheads on the bearings in the direction of the island. That indicates it is an RDF bearing. And that is common practice.

Q Captain, you have referred to running fixes and you pointed out one on Exhibit 1 -- correct me if I am wrong -- at time 1300? The components of that running fix are two RDF bearings and a sun line; is that correct?

A It is a noon latitude sight and two RDF bearings.

Q The noon latitude sight would be the line that is roughly east and west; is that correct?

A That is correct.

Q And was that taken at 1300 or is that the line taken at noon or at apparent noon and advanced to 1300?

A That was the line taken at local apparent noon and advanced to 1300 at a speed of -- estimated speed of 23 knots.

Q Captain, are there any running fixes on Exhibit 1 that are composed solely of RDF bearings?

A No. No, there are no running fixes solely of RDF bearings.

Q Captain, that could be done, though, could it not?

A Yes.

Q By taking a number of these RDF bearings and advancing them on the course of 353 degrees at 23 knots?

A Yes.

Q And that would be the running fix that would result from just RDF bearings?

A Yes.

Q You told me that one RDF bearing was taken

during the squall and was not perhaps as accurate as the others. Is that on the chart at all?

A Yes, I believe that was the 1300 RDF bearing.

Q And that is the line on Exhibit 1 at 1300 labeled "RDF, 302°"?

A Yes.

Q Can you tell me if that one is accurate to within ten degrees?

A To the best of my knowledge.

Q But it is put on the chart at 302 degrees. Why at 302 rather than 297 or 307 degrees?

A Because we took the mean of the null and took the mean bearing, and then we applied our corrections and that is the figure we arrived at.

Q Describe for me the mean of the null.

A Well, for instance, if you were listening to your radio, your RDF station signal, and the signal faded at approximately a bearing 280, and then you did not pick it up again until it was bearing 270, again, when you started picking up your radio signal again audible, you just find the difference between the two bearings, which in this case is ten. You divided by two, which is five degrees, and apply it to the 270, which would make 275. And that's --

Q Captain, if you were receiving such a signal, would your projection of your D.R. position have any effect on your interpretation of where the mean of the null was?

A No.

Q Captain, if you knew, for instance, at 1300, just based on dead reckoning, that St. Andrews should bear about 302 degrees from you, would that affect your interpretation of the information given to you on the RDF?

A No, because you are looking for two results and not just what you would like to have that bearing come in at. And if you go ahead and step your distance off and assume and work your bearing out ahead of time, that might influence your thinking.

So therefore, it is very good practice not to do that.

Q Well, Captain, if that bearing is accurate only within ten degrees, I am still at a loss as to how the figure of 302 comes out.

A Well, I don't know that it is off-- I mean, the null period is ten degrees, but I don't know that the bearing is off ten degrees, and the recommended practice is that you take the mean of the null. And that is what

we do. We take the mean of the null, apply our corrections, and lay it down on the chart. Where it comes on the chart, you should assume that that is approximately correct.

Q Captain, the 1300 line of position, RDF line of position, did you take that?

A No, I forgot. I can't recall whether I took that one or not, whether I checked that one or not. Possibly I checked the third officer, but I can't recall.

The fact is, the fact is I am pretty sure I did, yes.

Q You took it?

A I am pretty sure that I checked the third officer in this case.

Q Captain, on Exhibit 2, on the lines that you have inscribed on there -- I take it this is in your hand?

A Yes, it is.

Q Are these all RDF lines with the exception of those that are labeled sun lines?

A Yes, all the lines that terminate at St. Andrews Island, yes, are RDF bearings.

Q Captain, did you pick up the light on

Roncador?

A No.

Q Did you attempt, make any attempts, to get an RDF bearing on St. Andrews prior to 0900?

A No.

Q So these were all daytime readings?

A Yes.

MR. KOSTER: I have no further questions.

RE-EXAMINATION

BY MR. O'REGAN:

Q When is the last time you spoke with Capt. McGinty?

A I don't recall. Two or three -- about two years ago, I guess.

MR. O'REGAN: No further questions.

(Whereupon, at 4:20 P.M., the deposition adjourned as above set forth.)

* * *

I N D E X

WITNESS	BY MR. O'REGAN	BY MR. KOSTER
Lloyd David Lowell	3, 46	20

* * *

E X H I B I T S

CARGO CLAIMANTS LOWELL FOR IDENTIFICATION		PAGE
1	Chart, N.O. 26,000,	16
2	British Admiralty Chart No. 1218,	16

* * *

BORAK REPORTING 150 NASSAU ST.

STATE OF NEW YORK)
) ss:
COUNTY OF NEW YORK)

I, HARVEY B. KRAMER, Notary Public of the State of New York, do hereby certify that the foregoing deposition of LLOYD DAVID LOWELL was taken before me on the 11th day of October, 1973.

The said witness was duly sworn before the commencement of his testimony; that the said testimony was taken stenographically by myself and then transcribed.

The within transcript is a true record of the said deposition.

I am not connected by blood or marriage with any of the said parties, nor interested directly or indirectly in the matter in controversy, nor am I in the employ of any of the counsel.

In witness whereof I have hereunto set my hand and seal of office at the County and State of New York, this 26th day of October, 1973.

Harvey B Kramer

HARVEY B. KRAMER
NOTARY PUBLIC, STATE OF NEW YORK
Qualified in Queens County
No. 41-2191265
Term Expires March 30, 1975

DEPOSITION OF MICHAEL ROBERT McMAHON

Master of the "Irish Stardust" (Ex. Q)

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	72 Civ. 3199
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, - against - S.S. IRISH SPRUCE, her engines, tackle, etc., - and against - IRISH SHIPPING LTD., Defendants.	72 Civ. 656

TESTIMONY OF CAPTAIN MICHAEL ROBERT McMAHON taken by the Plaintiff pursuant to the provisions of the Federal Rules of Civil Procedure and the within Stipulation, at the offices of Messrs. Macrae, Montgomery, Spring & Cunningham, at Vancouver, British Columbia, Canada, on February 15th, 1974.

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I N D E X

Witness	Direct	Cross	Redr.	Recr.
Captain Michael Robert McMahon	3	19	52	53

E X H I B I T S

Exhibit No.	Identified
Captain McMahon Exhibit No. 1	4
Captain McMahon Exhibit No. 2	13
Captain McMahon Exhibit "A"	20
Captain McMahon Exhibit "B"	50

APPEARANCES:

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By: JOHN C. KOSTER, ESQ.

STEPHEN L. COUTTS,
Official Court Reporter

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S T I P U L A T I O N

IT IS STIPULATED AND AGREED by and between the parties that the testimony of the witness, CAPTAIN MICHAEL ROBERT McMAHON, may be taken down in shorthand (Stenotype) by Stephen L. Coutts, and by him transcribed or transcribed under his supervision, the formalities of signing, sealing, certification and filing being waived, and all objections, save to the form of the question, being reserved to the time of trial.

IT IS FURTHER STIPULATED that the testimony may be taken before the said Stephen L. Coutts in his capacity as an Official Court Reporter in and for the Supreme Court of British Columbia, Province of British Columbia, Canada.

CAPTAIN MICHAEL ROBERT McMAHON, having first been duly sworn, was examined and testified as follows:

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MR. KOSTER: It is further agreed that the oath may be administered by the Canadian Court Reporter with the same force and effect as though administered by an officer of the American Consulate Service.

EXAMINED IN CHIEF BY MR. KOSTER:

Q Captain, have you given the reporter your full name?

A Yes, I have.

Q And what is your address?

A 34 Seapark Malahide, County Dublin, Ireland.

Q Captain, by whom are you employed?

A Irish Shipping Ltd., Dublin.

Q And in what capacity are you employed by them?

A As a Ship's Master.

Q And to become a Ship's Master did you attend any nautical schools?

A Yes.

Q What schools?

A The Irish Nautical College in Dun Laoghire in Dublin.

Q Do you hold a licence?

A Yes, I have a licence as a Master Mariner issued by the Irish Government.

Q How long have you held a Master's licence?

A Fourteen years.

Q And during the course of that fourteen years have you

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also served as Master on various ships?

A Yes, I have, yes.

Q Are you presently in command of a ship?

A Yes.

Q What ship is that?

A Master of the IRISH STARDUST.

Q And on board the IRISH STARDUST what are your present plans?

A We will begin loading tomorrow in Vancouver and various B.C. ports for Japan.

Q When will you leave for Japan?

A I would say in six or seven days' time.

Q Captain, I show you a chart untitled B.A. Chart 1218 and ask you if you are familiar with this particular chart.

A Yes, I am.

MR. KOSTER: Let the record indicate that the chart is entitled "West Indies San Juan de Nicaragua to C.Gracias." Mr. Reporter, could I ask that this chart be marked McMahon Exhibit 1.

(EXHIBIT 1 - B.A. CHART 1218 - West Indies San Juan de Nicaragua to C.Gracias.)

Q Captain, referring to B.A. Chart 1218 which has now been marked McMahon Exhibit 1 there is an area on the chart that shows a body of water between two areas entitled Quita Sueno Bank and Serrana Bank. Could you tell me

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approximately how many times you have had occasion to transit that area either in a north or south direction?

A I would say I have passed through the area approximately fifteen times.

Q Captain, did you make such a voyage southbound in 1968?

A Yes.

Q Would you describe that voyage?

A Which voyage? I made I would say in 1968, I made voyages in the area.

Q Well, did there come a time on any of those voyages headed southbound where you were unable to for some time or at least -- well, for some time to establish your position?

MR. O'REGAN: Objection, leading.

MR. KOSTER: Do you object to the form of the question?

MR. O'REGAN: Yes, I do.

MR. KOSTER:

Q Captain, would you describe both of your voyages then in 1968?

A Yes, on my first voyage in 1968 I don't recall it very clearly. There was nothing outstanding about it.

Q And your second voyage?

A And the second voyage I had considerable difficulty approaching the Quita Sueno Bank due to lack of positions.

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Q Now, Captain, can you tell me what area this difficulty arose?

A On the -- the difficulty arose in this general area north of the two banks.

MR. KOSTER: Captain, would you indicate with a red pen the area you have just indicated --

A M. hm.

MR. KOSTER: -- and what had been your ship's general position in approaching that area.

MR. O'REGAN: Excuse me, from which direction is he coming now?

MR. KOSTER: Southerly.

MR. O'REGAN: Heading south?

A Yes.

MR. KOSTER: Read that back, please.

THE REPORTER: "Captain, would you indicate with a red pen the area you have just indicated and what had been your ship's general position in approaching that area."

A Well, we had -- our last known position was off Cape San Antonio in Cuba and we were travelling to Cristobal and since leaving the Cuban Coast I had no fixes and I was approaching this area from norwest.

MR. KOSTER: Captain, when you just indicated with the pen the angle of your approach could you draw on the chart

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what you have just indicated with an arrow?

A Yes, as closely as I can remember I was coming down in the direction like this.

MR. KOSTER: Would you label that arrow with the letter "A".

Q Captain, what then did you do?

A At about 1 a.m. -- I can't remember what the date was -- at about 1 a.m. as I recall I stopped the ship.

Q And what was your purpose in doing so?

A To wait until morning twilight to try and find out where we were.

Q And at morning twilight did you in fact find out where you were?

A Yes, I did, yes.

Q And approximately where were you when you were able to fix your position at morning twilight?

A I was in this vicinity here.

MR. KOSTER: Captain, would you make a circle or triangle in the area that you are indicating and would you label the triangle that you have just drawn with the letter "B".

Q Captain, were you able to determine from your experience on that voyage the set that you had experienced?

A Yes, we experienced a considerable easterly set in this case.

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Q Captain, on other voyages that you made through the area covered by B.A. Chart 1218 have you had occasion to attempt to obtain R.D.F. readings on the aero beacon at San Andres?

A I have, yes.

Q On what voyage would that have been?

A That would have been in either June or July of 1972.

MR. KOSTER: Captain, as best as you can recall I would like you to draw on B.A. 1218 which has now been marked McMahon Exhibit 1 the approximate track your vessel was on on that occasion and perhaps for clarity if we could change to blue ink to distinguish between the two.

A This is the 1972 voyage?

MR. KOSTER: Yes.

A I would say a track close to that.

MR. KOSTER: Let the record indicate that the master has now drawn a track on McMahon Exhibit 1 in blue ink and Captain, let me ask you to label that line -- two lines actually that you have drawn with the letter "C".

Q Captain, what vessel were you aboard at the time you transited the area marked by the line labelled "C"?

A Aboard the IRISH ELM.

Q And on that occasion were you headed in a southerly or northerly direction?

A Southerly direction.

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Q Captain, at which particular area of your course did you attempt to obtain any R.D.F. readings on the beacon at San Andres?

A As near as I can remember from -- it would have been from-- from this area to down about here.

MR. KOSTER: Captain, would you label the northerly portion where you first started to take bearings with a short arrow over to the side and label it with the letter "D", and would you label the southerly end of the line where you no longer took bearings with the letter "E".

Q Captain, approximately what time of the day was it when you were in the position near the area marked "D" on the chart?

A I am not absolutely certain of the time, but it would have been coming on for evening.

Q And at what portion of the line between "D" and "E" would you have approached daylight?

A As far as I can recall we were down here for daylight.

Q Yes, would you draw a short arrow to the side of the portion of the line that you are indicating and label it with the letter "F" and that letter "F" would indicate the approximate position of your vessel as you were approaching daylight.

A M. hm.

Q Captain, what sort of R.D.F. equipment was aboard the

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IRISH ELM?

A Marconi Lodestar.

Q And did you personally attend to attempt to take these bearings?

A Yes, I did.

Q Captain, did you obtain any returns or if so what -- well, did you obtain any?

A I did, yes, and during the daylight bearings I found passed within about four miles of the vessel's known position -- four to five miles of the vessel's known position and at night I found I couldn't get a zero on the station at all. I found the bearings to be useless.

Q Captain, when you say "during the day," that would be those bearings that were taken during that segment of the course line that exists between "E" and "F"?

A Yes.

Q And that would be when your vessel was generally to the west of San Andres?

A To the east.

Q To the east, I am sorry. Captain, do you recall the weather on that particular occasion?

A The only thing I recall about it is that the wind was between east and northeast and fresh to strong and the sea was rough, but I can't recall any other details.

Q Captain, approximately how many times during the course

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of the evening hours on that voyage did you make an attempt to obtain an R.D.F. signal from San Andres?

A I don't know for sure, but I would say that it was tried every hour.

MR. O'REGAN: I didn't hear that.

THE REPORTER: "I don't know for sure, but I would say that it was tried every hour."

MR. KOSTER:

Q Captain, I believe you told me before that you were unable to obtain a null?

A A zero we call it.

Q Unable to obtain a zero. Could you tell me what that means?

A Well, when you are taking a bearing of a radio beacon the point at which the signal is at an absolute minimum or silent altogether is the point of the bearing and this we call a zero. This would give a sharp bearing, but in the event of it -- of interference sometimes or distance from the station it sometimes happens that the zero might cover two or three degrees, but in this case of taking the bearings at night I could obtain no zero at all. The signal was even. There was no diminishing of the sound.

Q Does this exist throughout a spectrum or is it limited to a number of degrees?

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A Well, on this occasion it happened between relative bearings of about 30 degrees to a hundred and thirty-five.

Q Between those bearings you were unable to obtain a zero?

A Yes.

Q Captain, could you describe the equipment aboard the IRISH ELM other than by the model you already indicated? Is it automatic or is it --

A It can be automatic or -- it is automatic or manual.

Q True or relative?

A Either one. On automatic it was set for true.

Q Captain, on the occasions on the night in question how did you operate the machine? Was it operated automatically or on manual or both?

A Both.

Q And was your experience the same?

A Yes, there was no difference.

Q Captain, on the voyage that brought you here today to Vancouver where did you depart from?

A Departed from Tampa in Florida.

Q Do you recall approximately how long ago you departed Tampa?

A On the 29th of January, I believe.

Q And on that voyage did you have occasion to pass through the area that is covered by B.A. Chart 1218?

A I did, yes.

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Q Captain, did you at my request bring with you today the chart from the vessel that was used on that voyage?

A I did.

Q Captain, is this that chart?

A It is, yes.

MR. KOSTER: I would ask that the reporter mark this chart as McMahon Exhibit 2, a B.A. 1218 Chart.

(EXHIBIT 2 - B.A. 1218 Chart)

Q Captain, was the B.A. 1218 chart that is now marked McMahon Exhibit 2, is that the working chart on the voyage that your vessel last just performed?

A Yes, it is.

Q Captain, were any R.D.F. bearings on San Andres taken on that voyage?

A Yes, there were.

MR. KOSTER: Could you indicate where on the chart those bearings may have been plotted. Captain, would you mark all four of those respectively starting from north to south with the letters "A", "B", "C" and "D".

Q Captain, I note there is an additional line in there that is not labelled. Can you tell us anything about that line?

A That is also a D.F. bearing of San Andres that I believe I took myself as a check on the watch-officers. That is why it is unmarked.

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MR. KOSTER: Captain, would you label that line we have just been referring to with the letter "E".

Q Captain, may I take it that line was taken sometime between the 1000 line and the 1105 line?

A Yes, I would have taken that shortly after 10 o'clock.

Q Captain, did you thereafter obtain a fix by any other means?

A Yes, we obtained a fix for noon.

Q And where is that on the chart?

A Here.

MR. KOSTER: Would you just write a short line to it and label it with the letter "F".

Q Captain, do you recall the course and speed that your vessel was on at that point and at my request the Captain has also brought his log book today and I take it it would be all right for him to look at it?

A The vessel speed at that time was 14.3 knots.

Q And the course?

A I am sorry, and the course was 170 true.

MR. KOSTER: Captain, could you back up your D.R. from your known noon position to your 10 o'clock position, 10 o'clock D.R.

A Yes.

MR. KOSTER: Would you do that for me, please.

MR. O'REGAN: Do you want that page marked?

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MR. KOSTER: I don't see anything in there I would like to mark it for.

MR. O'REGAN: I will take a look at it later.

MR. KOSTER: Take a look at it and if you want a copy of it marked -- the Master would prefer to take the log book with him on the ship.

MR. O'REGAN: Could I have that last question, please, Mr. Reporter.

THE REPORTER: "Captain, could you back up your D.R. from your known noon position to your 10 o'clock position, 10 o'clock D.R."

MR. KOSTER: Captain, I think you could probably best do that in blue ink and would you just write next to that 10 o'clock D.R.

Q Captain, is there a 1000 D.F. line on the chart?

A There is.

Q Is that the line labelled "C"?

A That is right.

Q Could you measure the distance from your 1000 D.R. to the line labelled "C" or the nearest point of that line?

A The nearest point of the line?

Q What distance is that, Captain?

A Approximately five and a half miles.

MR. O'REGAN: Could I have that back, please?

A Sorry, approximately five and a half miles.

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MR. KOSTER:

Q Captain, did the experience that youhad on this most recent voyage compare insofar as the D.F. bearings and San Andres were concerned with the D.F. bearings you took during the day and your voyage in '72?

A I am sorry, would you repeat that, please?

Q Did yourexperience with the D.F. station on San Andres on your most recent voyage compare sofar as the accuracy is concerned with what you observed in your voyage in 1972 that you previously testified about?

A Oh, yes, yes, I would say so.

Q Captain, based on your experience do you have an opinion as to the reliability of the aero beacon on San Andres as an aid to navigation?

A Yes, I do.

Q What is that opinion, Captain?

A In daylight -- during daylight hours the bearings taken from the radio beacon I would expect them to locate the ship within a circle of eight to ten degrees radius -- diameter.

Q And at night?

A And at night I would have no faith in them whatsoever.

Q Captain, based on your experience in sailing through this area do you have an opinion as to the nature of the currents in the area between Quita Sueno Bank and

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Serrana Bank in the immediate approaches to or from that body of water from either the north or the south?

A Yes, I do.

Q Would you tell us what that is, Captain?

A I have found that while the set is generally to the westward that it is not to be relied upon. That it varies considerably.

Q Captain, on the IRISH STAR did you say what sort of R.D.F. equipment the vessel has?

A Marconi Lodestone.

Q And is this equipment manual or automatic or both?

A Both.

Q And is it true or relative or both?

A Both.

MR. KOSTER: I have no further questions. You may cross-examine.

(PROCEEDINGS ADJOURNED FOR FIFTEEN MINUTES)

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. KOSTER: During the off the record period the Captain directed my attention to a minor error in his previous testimony that I may have induced by directing his attention to the wrong page in the log book.

EXAMINED IN CHIEF BY MR. KOSTER: (Cont'd)

Q Captain, would you look again at McMahon Exhibit 2, the chart for your most recent voyage. On what day were you

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passing through the area in the neighbourhood of the lines that have been marked?"A" through "F"?

A On the 1st of February, 1974.

Q And Captain, when you retracted your 1000 D.R. what speed did you use?

A 14.3 knots.

Q And in point of fact what day was that speed made on the 14.3 knots?

A On the 31st of January.

Q I see, and what speed did your vessel make on the 1st of February?

A 13.87.

Q Captain, does that appear on the copy of the deck log page of the IRISH STARDUST for February 1st, 1974?

A Yes, it is here.

MR. KOSTER: I ask that a copy of the deck log page of the IRISH STARDUST For February 1, 1974 be marked as McMahon Exhibit 3.

(EXHIBIT 3 - DECK LOG PAGE OF THE IRISH STARDUST FOR FEBRUARY 1, 1974)

MR. KOSTER: Captain, would you back up the 1000 D.R. position as you did before using the speed that you have just given me of 13.87 knots. Captain, would you mark that with the red pencil.

MR. O'REGAN: Off the record.

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(OFF THE RECORD DISCUSSION)

MR. KOSTER: Would you put an arrow to the dot perhaps extending out to the southwest and would you just write at the end of that, Captain, "1000 D.R. corrected." Captain, would you as you did before take a measurement from that corrected 1000 D.R. to the 1000 D.F. line on the chart labelled line "C".

Q What distance is that, Captain?

A Seven miles.

Q Captain, apart from the correction that has been just made does that alter the prior testimony or any opinions that you have expressed?

A No.

MR. KOSTER: I have no further questions.

CROSS-EXAMINED BY MR. O'REGAN:

Q Captain, I show you a publication entitled, "Admiralty List of Radio Signals Volume 2, 1971." Are you familiar with this publication?

A Yes, I am.

Q Is that published by the British Government?

A Yes.

Q Do you have one of those on board your ship?

A Yes, I do.

MR. O'REGAN: I would like to mark that as Cargo McMahon Exhibit "A".

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(EXHIBIT "A" - ADMIRALTY LIST OF RADIO SIGNALS, VOLUME 2, 1971)

MR. O'REGAN: Let the record indicate that we have marked this document as Exhibit "A" for today's deposition. We intend to remark it at the time of trial.

Q Captain, do you have this edition on board your ship, Volume 2, 1971?

MR. KOSTER: He has already answered that.

A As far as I know that is the same edition, yes.

MR. O'REGAN:

Q Do you find it to be a useful source of information for purposes of locating various stations from which radio direction bearings may be taken by using a ship's R.D.F. equipment?

A Yes.

Q Do you consider it important to have an up-to-date edition on board your vessel?

MR. KOSTER: I object to the form of that question. This witness isn't here to testify as to what he considers to be necessary practice.

MR. O'REGAN: Would you answer the question, please, Captain.

MR. KOSTER: Would you read the question back, please.

THE REPORTER: "Do you find it to be a useful source of information for purposes of locating various stations from which radio direction bearings may be

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"taken by using a ship's R.D.F. equipment?

A. Yes.

Q. Do you consider it important to have an up-to-date edition on board your vessel?"

MR. O'REGAN:

Q Captain, on page five of this exhibit there is a paragraph at the top of the page which states:

"This edition of the Admiralty List of Radio Signals, Volume 2, contains information received up to 14th August, 1971 and supercedes the 1969 edition of Volume 2."

As an experienced mariner what do you take that word "supercedes" to mean?

MR. KOSTER: I object. What this witness takes the particular word to mean has nothing whatsoever to do with his prior testimony and it is improper cross-examination.

MR. O'REGAN:

Q Would you please answer the question, Captain.

A I would understand it to mean that it takes the place of the 1969 edition.

Q Takes the place of the prior edition whatever that date would be, is that correct?

A Yes.

Q Captain, is it true that aero beacons are being used more and more as means to navigation by vessels at sea?

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A I don't know.
Q Well, you use them, don't you?
A When I have to, yes.
Q When you can?
A When I have to.
Q What do you mean by that, Captain?
A I wouldn't use an aero beacon in preference to a marine beacon.
Q Suppose all you had was an aero beacon?
A Then I would have to use what is available.
Q Captain, again on page five of this publication, paragraph number three indicates and states as follows:

> "All radio beacons including aero radio beacons are listed in geographical sequence. All appear in the alphabetical list of identification signals and all are numbered."

A Yes.
Q Captain, I would ask you using this publication would you check and see if San Andres beacon is not in fact listed as indicated in the preface. Would you do that, please, now. In order to shorten your searching through the publication I would refer you to page nine which is the index of geographical sections, is that correct?
A Yes, that is correct.
Q Running down the page do you see listed there "Columbia/

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Carribean Coast?

A Yes.

Q And numbers 5427-5439?

A Yes.

Q Captain, would you now using that information turn to page 183.

A M. hm.

Q Is it not a fact that annexed to the number 5439 which coincides to the number on page nine of the publication there is a listing there for Lisla San Andres, is that correct?

A Yes, that is correct.

Q And do you know what "Aero R.C." stands for which appears next to the number 5439?

A Yes, it means that this is an aero radio beacon.

Q And what do the letters "S.P.P" mean?

A That is its identification signal.

Q Morse Code identification signal?

A Yes, that is right.

Q And "387"?

A That is the frequency it is operating under.

Q And "A1", do you know what that means?

A That is its classification.

Q "1.0KW", what does that mean?

A It means its strength is 1 kilowatt.

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Q That would be a thousand watts, is that correct?
A Yes.
Q And the abbreviation "Cont." what does that mean?
A It means it transmits a continuous signal.
Q The last column of course is the location by latitude and longitude, is that correct?
A Yes, that is correct.
Q Captain, I now refer you to page 33 of the exhibit which you have before you and is it not a fact that San Andres aero beacon is also listed in the alphabetical list on page 33?
A Yes, it is listed here.
Q Captain, to correct the record, I made an error, this is really listed in the alphabetical list of Morse Code Identification Signals, is that correct?
A Yes, that is correct.
Q That is on page 33?
A Yes.
Q Captain, I now refer you to page 222. Does it appear there in the alphabetical index, the stations?
A Yes, it does.
Q So this publication, Captain, is a most important source of determining the location of stations such as San Andres, is it not?
MR. KOSTER: I object to the form of the question. Under

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what circumstances and to whom?

MR. O'REGAN: Would you answer the question.

MR. KOSTER: I direct him not to answer. I objected to the form of the question. It is too open-ended. To whom is it an important source and under what circumstances is it an important source?

MR. O'REGAN:

Q Captain, to a competent navigator --

MR. KOSTER: Objection.

MR. O'REGAN:

Q -- navigating his -- I assume the captain is a competent navigator.

MR. KOSTER: We are not talking about the captain.

MR. O'REGAN:

Q Captain, to a competent navigator while travelling at sea is this publication not a most important source of information?

MR. KOSTER: I still object. Travelling at sea -- where and in what area? Are there aero beacons around? Does he have any other source of information? The captain can't answer the question as it is stated.

MR. O'REGAN: Are you directing him not to answer that question?

MR. KOSTER: I am saying he can't possibly answer it as it is stated because you have not placed any qualifications on it.

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MR. O'REGAN:

Q Captain, can you answer the question?

A I can answer it giving my own opinion, yes.

MR. O'REGAN: Go ahead, Captain.

A This is an important source, yes.

Q Captain, if there were no listing either in the geographical index or the alphabetical index or any of the other sections we have referred to in that publication would you-- if you looked in the publication to determine whether there were any aero or radio beacons in the area, the absence of finding any listing would lead you to what conclusion if any?

MR. KOSTER: I object to the form of that question. What are you asking the witness to answer? If he looked in a book?

MR. O'REGAN:

Q Captain, do you understand the question?

A I don't think I do.

Q All right, I will rephrase the question, Captain. Captain, assuming you are at sea.

A Yes.

Q And you looked in that publication which you have before you to see if you had a radio navigational beacon be it aero or radio beacon in the area --

A Yes.

Q -- and you saw upon examination of that book that there

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was none in the area in which you were transiting either listed in the geographical index, the alphabetical index, the Morse Code identification idex or any other section we just looked at, what would be your conclusion?

MR. KOSTER: With respect to this book or some fictitious book that has a different index or a different table of contents?

MR. O'REGAN:

Q Captain, can you answer the question as I posed it to you? I am talking about this particular book.

A Yes, if I could not find the station listed in this book I would assume there was no station.

Q Captain, on page 19 of the same publication it is indicated, is it not, that the range for a beacon with an output power of 1 kilowatt, that is a thousand watts, is 240 miles. Do you agree that this is possible?

MR. KOSTER: Anything is possible. I object to the form.

MR. O'REGAN: Right now I am going to put a formal objection on the record to Mr. Koster's continually interfering with questions which he may find damaging. I believe the captain has understood most of my questions without counsel's testimony and I would request from this point on that the captain be permitted to testify and not Mr. Koster.

MR KOSTER: Well, I object to the objection because I don't

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characterize any testimony as damaging, but I think I am perfectly within my rights to object to the form including the word "possible."

MR. O'REGAN:

Q Captain, can you answer the question as I gave it to you?

A I can make an answer to it that I don't know if a range of 240 miles for 1 kilowatt power is right or wrong.

Q I see. Would you, based on your experience, have an opinion as to the range of 1 kilowatt aero beacon -- radio beacon or aero beacon?

A No, I don't think -- I don't think I would form an opinion regarding the range of a radio station from the power listed for it.

Q You wouldn't know?

A I wouldn't know.

Q Captain, I refer you to page 13 and specifically to the paragraph entitled, "Aero radio beacon (aero R.C.)" which reads:

> "A radio beacon established for the use of aircraft. Shown as aero R.C. in column two of station details and on charts. Only selected aero radio beacons likely to be of particular use for marine navigation are listed and charted. A directional aero radio beacon is known as a radio-range."

Captain, based on your experience as a navigator and a

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person familiar with this publication, d o you find that statement is generally a proper one, namely that stations listed with this publication are useful for navigation?

A Generally, yes.

Q Now, Captain, are you aware that not all aero beacons all over the world are not listed in this publication?

A I am aware they are not all listed.

Q Yes?

A Yes, I am.

Q The reason I asked you, on page 14 of this publication, paragraph four, it says:

> "A number of aero radio beacons considered to be particularly unsuitable for marine use have been omitted from this edition."

Do you find that is an accurate statement to the best of your knowledge?

A Yes.

Q Captain, do you consider that the Marconi Lodestone equipment that you had on board the IRISH ASH, the IRISH ELM, and the IRISH STARDUST were adequate pieces of equipment?

A In the IRISH ASH it was a Lodestone. In the IRISH ELM and IRISH STARDUST it is a Lodestar. It is a different model.

Q Is there a difference in the two?

A Yes, the two latter ones are later models.

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Q Did you in your experience with the Lodestone, did you find it to be a useful piece of equipment when operating in proper conditions?
A When operating in proper conditions?
Q Yes.
A Yes, I found it useful.
Q Well, then, Captain, assuming that you have adequate marine R.D.F. equipment on your vessels as I assumed you have had, is it not a fact that aero beacons can be used to advantage for purposes of navigating?
A Yes, they can be used, but I have always been taught that they must be used with caution.
Q They can be used but with caution?
A Yes.
Q You have to be careful when you are operating your equipment. You have to be --
A Well --
Q Excuse me, you have to use care and it takes some skill on the part of the operator to do it too, does it not?
A Yes, it does, but why I say this is because aero beacons are mainly beamed for aircraft rather than for surface vessels.
Q But is it not true that if you had a location of any radio station be it aero beacon, radio beacon or just a transmitting station of some sort, if you know where it is

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and it emits a strong enough signal you can use it to advantage for navigating and picking it up on your shipboard R.D.F. equipment, is that true?

A Yes, it can be picked up on the general direction known.

Q If you know where it is?

A If you know where it is.

Q That is why I am saying, if you know from your chart let's say where it is located you can use it to advantage when navigating?

A Yes, providing there are no external influences.

Q And are you familiar with the IRISH SPRUCE?

A Yes.

Q And its equipment?

A Yes.

Q I assume it therefore follows that aero beacons can be used to advantage if a ship such as the IRISH SPRUCE had adequate marine R.D.F. equipment and if it were in a proper working condition?

MR. KOSTER: Mr. O'Regan, I object again. I don't know how this witness can answer that question. He can answer questions based on his direct examination but how can he say what the circumstances or situation would be on a particular ship?

MR. O'REGAN: He just testified that he is familiar with the equipment on the IRISH SPRUCE.

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MR. KOSTER: Well, at what point in time is he to concern himself with the effectiveness of this equipment? Ten years ago, twelve years ago?

MR. O'REGAN: Any time on board the ship.

A Four years since I sailed on that ship.

Q Four years?

A Yes.

Q When were you on the IRISH SPRUCE?

A 1969.

Q 1969 from when to when as best as you can recall?

A I believe from approximately mid-July to mid-September.

Q Well, based on your knowledge of the equipment on the IRISH SPRUCE at that time I will go back to my other question and ask you again, is it not a fact that aero beacons can be used to advantage if a ship such as the IRISH SPRUCE had adequate marine R.D.F. equipment and if that equipment were working in proper condition?

A M. hm. When you say "used to advantage" --

Q Navigational-wise I am talking about.

A Yes, but I don't understand. Do you specify a degree of accuracy in this? I mean, "used to advantage," yes, but it is a pretty general kind of a statement.

Q Okay, well let me keep my question general but maybe this will make it clearer. Could it be used as an aid to navigation?

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A Yes.
Q Captain, do you know what a running fix is?
A Yes, I do.
Q What is it, please?
A It is a position arrived at through transference of single position lines in conjunction with the distance steamed in the interval.
Q Can R.D.F. bearings be used to obtain running fixes?
A They can, yes.
Q And can they be accurate?
A This would depend on a number of factors. One, on the degree of accuracy of the bearings involved, and two, on the off-set caused by any current or tide encountered in the interval. It is possible for them to be reasonably accurate, but it is also possible for them to be inaccurate.
Q Captain, the best way to obtain accurate fixes by using R.D.F. is to take a series of bearings at regular intervals, say fifteen minutes or less apart rather than just a few bearings spread over a longer period of time, is that correct?
A Yes, that would be substantially correct.
Q And by doing it at regular intervals is it not true that often a pattern develops and an accurate fix can be obtained?

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A Again generally what you say is correct, but you say "accurate fix." There is a lot in the word "accurate." I don't --

Q If you had nothing else?

A If I had nothing else I would accept the results of a running fix even with a series of radio bearings, but nevertheless I would still treat them with an awful lot of caution.

Q Fair enough. Captain, is it not also true that a navigator should use all available means that are at his disposal to navigate his vessel?

A Yes, that is --

Q Would this include using R.D.F. equipment?

A Yes, if he is using all available means it would.

Q Captain, I refer you to Exhibit 2 which has been marked here for identification today and I would ask you if you would -- to take the bearing, the zero 800 bearing which was obtained by R.D.F. I assume off SanAndres.

A Yes.

MR. O'REGAN: Would you plot for us, please, a running fix taking that bearing and the 1000 bearing off San Andres.

A Yes.

MR. O'REGAN: Captain, would you take this green pen and put an "X" on that position.

A M. hm.

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MR. O'REGAN: Captain, would you draw a leader out from that "X" and mark that "R.D.F. Running Fix."

Q Captain, how far to the east of your 1000 D.R. position is the R.D.F. running fix which we have just marked "X" in green? My question how far to the east?

A Yes, that is what I am going to do. About four and three-quarter miles.

Q To the east?

A Yes.

Q And how far to the north of your 1000 D.R. is that running fix?

A About five and a half miles.

Q That is a D.R. fixing using only two R.D.F. Bearings, Captain, is that correct?

A Yes.

Q Captain, are you familiar with a publication called Duttons Navigation and Piloting?

A No, I am not.

MR. O'REGAN: It is a navigation book we have in this country and has been referred to by Mr. Koster when examining other witnesses in this case. Captain, I refer you to page 325 of that publication and specifically to the statement which reads:

> "A new D.R. is not customarily plotted from an E.P..."

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"E.P." of course meaning "estimated position."

"...but a course line may be plotted from such a position to determine whether or not there is a possibility of the ship's standing into danger."

Q Do you agree with that statement?

A Yes. Yes, I would.

MR. O'REGAN: Captain, I now refer you to page 219 of the same publication which states:

"Since an E.P. is not a wall determined position it is not customary to run a new D.R. plot from such a position, however, a line representing the estimated course and speed being made good should be run from an E.P. to indicate the possibility of the ship standing into danger allowing the navigator to take an appropriate avoiding action before a dangerous situation develops."

Q Is that also an accurate statement?

A Yes, I would say so.

Q Now, Captain, can you tell us what is meant by an E.P? Estimated position, what is that?

A It is a position that would be arrived at taking into consideration distance run and allowance made for current and any other factors that might be available such as D.F. bearings that one wouldn't be too happy about.

MR. O'REGAN: I am putting before the Captain some charts

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which have been marked already in this case. These are copies. I don't have the originals. Do you have them with you by any chance?

MR. KOSTER: No.

MR. O'REGAN: These are Zerox copies, Captain. Mr. Koster's office has the originals but as I ask this next question I put thesecharts in front of you so you will have an idea of the location of what I am talking about.

A Yes.

Q Now, Captain, referring to the exhibits which have been marked for identification in this case, namely IRISH Deposition Exhibit "C" which is Chart 762 and IRISH Deposition Exhibit "F" which is Chart 1218, I would like to ask you the following question, Captain. Captain, I ask you to assume that you are sailing on a vessel such as the IRISH SPRUCE and at 1200 noon your position is fixed by celestial navigation to be latitude 111 degrees 13 minutes north and longitude 79 degrees 28 minutes west; that thereafter your vessel proceeds north on various courses; your navigation thereafter was by dead reckoning and that you are unable to obtain any star sights that evening; that your position by dead reckoning at 2000 was bearing 084 degrees true from San Andres Island, a distance of approximately 112 miles; that you are at that point on a heading of 330

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degrees true and had been on that heading since 1555 that afternoon; that at 2400 you would change course to a heading of 323 degrees true; that according to your D.R. plotting your closest point of approach to San Andres Island would be about 102 miles. Would a series of R.D.F. bearings taken on San Andres at intervals of fifteen minutes or less be of assistance to you in checking the position of your vessel as you proceeded?

MR. KOSTER: I object to that question, Mr. O'Regan, because you haven't told him what the R.D.F. bearings might have been.

MR. O'REGAN:

Q Captain, --

MR. KOSTER: If he can answer it well --

A Would the bearings be of assistance? I don't think the bearings would have been any help whatsoever.

MR. O'REGAN:

Q Why is that, Captain?

A Because from my own findings in these latitudes that once darkness came I could never get a proper radio bearing. After about 1700 in the evening I couldn't get a proper radio bearing.

Q How many times did you try to get radio bearings at night going in this area?

A In this area I think I have tried to get radio bearings

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in some sector of the area at night on every voyage.

Q You have tried, have you not?

A Yes.

Q I see. Well, you testified as to one particular voyage here at night.

A M. hm.

Q What about the other voyages? Weren't there some where you did in fact pick up the San Andres aero beacon at night.

A I could hear the station all right, but not to get a bearing that I could use.

Q How many times would you say in your transit in this area you personally tried to take a bearing on San Andres at night?

A That is very difficult to say.

Q Many times?

A Well, I would say quite a few, yes.

Q You didn't give up, did you, Captain? You didn't give up trying?

A I didn't give up, no, but it depended on where I was while I was trying.

Q What do you mean by that, Captain?

A Well, what I mean is that if I were clear of this area to the southern --

Q Indicating the area of Quita Sueno and Serrana Banks?

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A In other words out in open safe water I wouldn't remain up all night trying to get him.
Q Suppose you were heading northerly and the further you got past San Andres in a northerly direction you would be trying more and more, would that be correct?
A I would keep trying in the hope that I might get one.
Q Did there ever come a time in all of these transits that you have got at least one, Captain?
A Of San Andres in particular or of any station?
Q I am talking about San Andres?
A No, I cannot ever recall ever having a reasonably accurate bearing from San Andres in darkness or for that matter any kind of bearing.
Q What do you mean "reasonably accurate bearing"?
A A bearing within or a zero even of 10 or 15 degrees whereby I could take a mean. My experience down there at night has been that I just get a sector with a continuous sound -- continuous signal with no zero on it.
Q What is the closest spread you have? I am talking now in your attempt to obtain a null.
A Yes, I see what you mean. I don't really know.
Q Have you gotten one 20 degrees?
A I expect I have. I can't say definitely.
Q Have you gotten one 10 degrees?
A What I have been saying a few moments ago was not so much

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too large a silent sector as no silent sector at all.

Q Well, when you said 20 degrees what were you talking about there?

A I was referring to what you were referring to, but the one that is -- the night that I have in mind that sticks in my mind more, this particular night I couldn't get one at all.

Q [illegible] one particular night you couldn't get one at all?

A M. hm.

Q But there were other nights when you could get something, is that true?

A There were other nights when I could get them.

Q You could and --

MR. KOSTER: Let the witness finish.

A Yes, I see what you are -- what you mean where you mean the null period as you call it, but what happens down here where there is so much static around is that at times the bearing alters entirely.

MR. O'REGAN:

Q Captain, I understand what you are saying, but my question to you is if you are sailing in that area and you are at night and the only means to navigate is by this aero beacon --

A Yes.

Q -- my question is is it not prudent navigation to keep

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trying to get bearings on that light?

MR. KOSTER: I object.

MR. O'REGAN:

Q And is it not also true there have been occasions in your experience where you obtained bearings at night on San Andres?

MR. KOSTER: I object to the form of the question. It is a compound question. You have already characterized the station as a means to navigation and that is not in accordance with what the Captain has testified. Now, if you care to break down your questions down do so, but he can't answer a compound question.

MR. O'REGAN: Read the question back and I will ask the witness if he can answer it and if he can understand it.

THE REPORTER: "My question is is it not prudent navigation to keep trying to get bearings on that light? And is it not also true there have been occasions in your experience where you obtained bearings at night on San Andres?"

MR. O'REGAN:

Q Do you understand the question? It is twofold.

MR. KOSTER: A yes or no doesn't necessarily follow.

MR. O'REGAN: He can answer any way he wants.

MR. KOSTER: I am not going to permit him to answer any way he wants.

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MR. O'REGAN: Are you objecting to the Captain answering my last question?

MR. KOSTER: Will you break it up into two and I will decide whether I have any further objections or not, but it is a compound question.

MR. O'REGAN:

Q Do you understand the question, Captain?

A I think I do.

Q Would you try and answer it, please.

A The first part is regards to keep on trying to get a bearing. I think I would keep trying to get a bearing, and the second part I think I can honestly say I have never had a bearing of San Andres that I could use at night.

Q But I think you have testified that you have them with a spread of 20 degrees, is that true?

A I am speaking in very general terms when I said that.

Q Let us take 20 degrees as a very general term.

A I could not swear on any specific occasion I have had one with a spread like that.

Q Have any of your navigators to your knowledge bean able to get a bearing at night on San Andres?

A No.

Q Do you know that to be a fact or are you just assuming?

A I am assuming. It is based on when I would ask a watch

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officer if he had got bearings and he would tell me that he couldn't get them.

Q Do you know that there has been prior testimony in this case by Captains from United States Lines?

A Yes, I have heard that.

Q What have you heard about that testimony?

A Just that they got -- they considered San Andres to be very helpfu'.

Q Do you know what distances they got those bearings on?

A No, I don't think I do.

Q What if I told you that there is testimony to the effect that bearings were taken on San Andres and considered to be of reasonable accuracy at distances at over 150 miles?

A What would I say --

MR. KOSTER: Is that a question?

A -- if you told me this?

MR. O'REGAN: Yes.

A Well, I would say that the person who says that he got accurate bearings at that distance at night had some other form of navigation. That he had either a Loran or Decca. That he had some other means of knowing where his ship was.

Q I am just talking about the bearings.

A I know you are but the fact that a Master has a pretty

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good idea of where his ship is will affect his judgment of bearings too.

Q Now, Captain, isn't that really an opinion on your part which implies that Masters don't really want to put their vessel where navigational aids say they are?

MR. KOSTER: I don't understand that question.

A No, I am not implying anything. What I am saying is that if I know where my ship is and I get a bearing that I am not too concerned perhaps about whether the bearing is right or wrong because I know where the ship is.

MR. O'REGAN:

Q Suppose the bearing checks in with where your ship is?

A That can happen.

Q In other words, if you plotting a bearing you are plotting a bearing and not a bearing that you hope is a bearing?

A Yes, I know what you mean.

Q Is that correct?

A Yes, I know.

Q You are a competent navigator.

A I plot the bearing as it is.

Q And don't most competent Masters do the same and expect the same of their officers?

A Yes.

Q Before you try to use a beacon either aero or radio

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beacon you would want to know what its power was to see how far it could transmit, wouldn't you?

A Yes.

Q For example, if it were listed on page 19 of Radio Signals which has been marked Exhibit "A", if it were listed there as 0.025 kilowatts you would know you couldn't get it if you were a hundred miles away, is that correct?

A Well, that is correct, yes.

Q But if you knew it were listed as having output power of 1 kilowatt with an expectable range of 240 miles as listed in that publication you would certainly keep trying to get it, wouldn't you? If you were to pass within that range?

A I would try to get a bearing off it, certainly, if I would be in range of it.

Q Captain, before in your testimony when you were answering Mr. Koster's questions about your various voyages down there you indicated that you didn't recall too much about your first voyage.

A Yes.

Q Because there was nothing unusual. What did you mean by that?

A Well, by that I mean that we probably passed through this area, passed the Quita Sueno Bank in daylight and I had positions so I had no cause for concern. I say probably because this all happened five years ago.

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MR. O'REGAN: Now, I call for the production of the logs for each trip that the Captain has testified to today.

MR. KOSTER: I will attempt to produce them for you. I assume you already have the log for the current voyage, the log page. The other I recollect was in '72 and that should be available. The earlier one, '68, I don't know about, but I will certainly inquire and if it is still available I will produce it.

MR. O'REGAN: Thank-you.

Q Do you remember now exactly referring to the voyage where you stopped your ship at one a.m?

A Yes.

Q Do you remember exactly what course you were on at that time?

A No.

Q You don't know?

A Just generally.

Q Do you know where your vessel was when you stopped it at one o'clock?

A No, that is why I stopped it.

Q You didn't know?

A I have a good idea.

Q You don't know where you were at one o'clock, do you?

A I didn't then, no.

Q What time of the year was this, Captain?

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A I am not sure, but I think it was towards the end of the year, around in November '68, but I can't be absolutely certain.

Q You did testify also that in June or July of '72 you tried to get --

A That is correct.

Q -- a reading on San Andres?

A Yes, that is correct.

Q What was the result of that? You had some difficulty you said?

A I had, yes, at nighttime I couldn't get a bearing. Could get no zero on it whatsoever and by day I think I had the position. It came within a four to five mile radius roughly of the known position of the ship.

Q You were then heading in a southerly direction as I recall?

A That voyage, yes.

Q Who tried to get the bearings on that voyage at night, do you know?

A At night?

Q Yes.

A Well, this would have been divided between the Watch Officer and myself.

Q How long were you on the bridge?

A I don't know exactly, but I would have been on it for a considerable length of time in the vicinity of that

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bank -- reef, I should say.

Q How often did you try to get bearings on San Andres?

A During that night?

Q Yes.

A I could only guess and say it was tried every -- possibly about every hour, but I don't really know.

Q You don't know. Is it also a safe statement that during all of your transits at night in this area the average of your attempts to get a bearing on San Andres would be about once an hour, is that correct?

A During all of the transits?

Q Yes.

A I don't know whether that would be true to say for all of the transits or not.

Q What is the practice on board your ships, the ones that you are Master?

A Well, the practices will vary because depending on what information I already have approaching the area. For example, if I approach in the afternoon I have already had true positions so I am pretty sure of where the ship is or if I approach at say between six and midnight, okay, I have had a fix again but later than that as the run from the last position would get longer I would be very, very careful. I would try and get bearings but try anyway.

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Q Thank-you, Captain. Captain, again referring to the night occasion that you were questioned about by Mr. Koster, you mentioned something about bearings between 30 degrees and 135 degrees relative. What did you mean by that?

A These would be bearings within those limits. Thirty degrees on the starboard bow to 135 relative to be on the starboard quarter. The station would be on the starboard bow and the ship passing it until then it was on the starboard quarter.

Q What kind of antenna did you have on the IRISH ELM?

A Loop aerial. D.F. loop aerial.

Q Directional?

A Do you mean can it be rotated?

Q Yes.

A No, not the -- you rotate on the dial on the goniometer.

MR. O'REGAN: I have a publication here, Captain, "East Coast of Central America and Gulf of Mexico Pilot, First Edition, 1970." Please mark this Cargo McMahon Exhibit "B".

(EXHIBIT "B" - EAST COAST OF CENTRAL AMERICA AND GULF OF MEXICO PILOT, FIRST EDITION, 1970)

Q Are you familiar with this publication, Captain?

A Yes.

Q It is part of the British system of navigational

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publications?
A Yes, it is.
Q Do you find it to be a useful source of information?
A I find all pilot books useful.
MR. KOSTER: I am sorry, I didn't hear your answer.
A I find all of the pilot books useful.
MR. O'REGAN:
Q You consider it important to keep the most up-to-date
.ition on board your vessel?
A Yes.
MR. O'REGAN: Off the record.
(OFF THE RECORD DISCUSSION)
MR. O'REGAN: Captain, I show you another document which has previously beenmarked in this case as Deposition Exhibits "G" and "G-1" and it is the West Indies Pilot, Volume 1 and Supplement Number six to that publication. I refer you now to pages 361 and 362. Would you read the section to yourself about Quita Sueno Bank.
Q Is there any information in that section which you just read concerning current?
A No, it doesn't mention current here.
MR. O'REGAN: Now, Captain, that was Exhibit "G" I was referring to. Now would you refer to Deposition Exhibit "G-1" which is the Supplement Number six and specifically to page 57 and I point to paragraph numbered page 361. Would

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you read that paragraph, please, Captain.

Q Is there any mention there of current?

A No mention of current.

MR. O'REGAN: Captain, I refer you now to page 74 of McMahon Exhibit "B" which is the East Coast of Central American and Gulf of Mexico Pilot, First Edition, 1970, and I read to you under the heading "Quita Sueno Bank" which appears on 73 the statement which appears on page 74:

> "Current -- caution -- caution should be exercised when passing eastward of Quita Sueno Bank as the current here sets strongly to the westward and on to the bank."

Q That paragraph I just read to you, do you think that that is important information to have on board your vessel when transiting this area?

A Yes.

Q And to get this specific information this is a publication you would refer to, is that not correct?

A Yes, that is correct.

MR. O'REGAN: No further questions.

RE-EXAMINED BY MR. KOSTER:

Q Re-examination. Captain, in the exhibit that was just referred to, Cargo McMahon Exhibit "B", it speaks of current setting westerly over the bank. Was that your experience in navigating through the area?

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A I haven't experienced the current setting to the west in the vicinity of the bank so much as more north and south in that channel.

Q As you previously testified in fact on your voyage in 1968 you were set to the east?

MR. O'REGAN: Objection, he didn't testify to that at all.

MR. KOSTER:

Q Well, Captain, on your voyage in 1968 when you eventually located your position what direction had you been setting?

A We had been set to the eastward.

MR. KOSTER: I have no further questions.

RE-CROSS-EXAMINED BY MR. O'REGAN:

Q Captain, when you were talking about your R.D.F. bearing attempts on prior voyages -- I am referring to each of the vessels that you were on -- was the equipment operating properly to the best of your knowledge?

A Yes.

Q Did the equipment have calibration cards?

A Yes.

MR. O'REGAN: I would ask for the production of those calibration cards.

MR. KOSTER: Again, I will attempt to obtain them and if they are still in existence I will provide you with them.

MR. O'REGAN:

Q Do you keep maintenance records for your R.D.F. equipment?

OFFICIAL COURT REPORTERS
COURT HOUSE
VANCOUVER 1, B.C.

A By maintenance now do you mean electrical maintenance or mechanical maintenance?

Q I mean shipboard maintenance as well as maintenance at shore.

A This is the Marconi responsibility. If there is anything defective about the equipment we call Marconi to repair it.

Q And do you keep records of these repairs and servicing?

A We don't, no, either the radio officer or Marconi's would have them.

Q The radio officer who works for IRISH SHIPPING?

A No, the radio officer is employed by Marconi's.

Q I see, but does Irish Shipping keep a copy of these invoices, do you know?

A I would imagine so.

MR. O'REGAN: I would ask for the production of any such records for the period of six months preceding each of the voyages that the captain testified to.

MR. KOSTER: I will attempt to locate these records and if they are still in existence I will provide them to you.

MR. O'REGAN:

Q On your vessel do you keep an R.D.F. operating log?

A Of each time it has been used?

Q Yes.

A No.

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COURT HOUSE
VANCOUVER 1, B.C.

Q Do you know when each of the R.D.F. sets that you used and testified with regard to today were last calibrated prior to the voyages that you testified to today?
A The only one I know about is the present one on the IRISH STARDUST.
Q When was that last calibrated?
A In July of 1972.
Q July of 1972?
A Yes.
MR. O'REGAN: Off the record.
(OFF THE RECORD DISCUSSION)
MR. O'REGAN:
Q Captain, I ask you now if you can thus recall the R.D.F. on the IRISH ASH how old that equipment was.
A Oh, --
Q Do you know the age of the equipment?
A Well, it would be approximately the same age as the ship and the ship at that time was about 12 years old.
Q And would the same follow true for the IRISH ELM and the STARDUST?
A Yes.
Q In other words the age of the ship?
A Yes.
Q On each of the trips that you testified with regard to today what was the weather on those occasions?

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VANCOUVER 1, B.C.

A As far as I can recall for the IRISH ASH the weather was fine. This was the occasion the night that we stopped.

Q Yes?

A The weather was fine then because the purpose in stopping was to get star sights and all that I can recall about the IRISH ELM was that we had a fresh to strong northeasterly wind or east to northeasterly wind and a rough sea, but I can't recall any other details about it and this present voyage of the IRISH STARDUST the weather was good.

Q Captain, what is the distance from San Antonio, Cuba, to the triangle you have marked as "B" on McMahon Exhibit 1?

A I don't know offhand.

Q Roughly do you have any idea?

A I think it is about 450 miles.

Q Four hundred and fifty miles?

A M. hm.

Q That was your last fix, is that correct, before stopping at 0100?

A Yes.

(CONCLUDED)

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COURT HOUSE
VANCOUVER 1, B.C.

C E R T I F I C A T E

I, Stephen L. Coutts, do hereby certify that the above and foregoing is a true and correct transcription of the stenographic (Stenotype) notes of the proceedings herein, taken down by me and transcribed under my supervision, at the time and place hereinbefore noted, in the above-entitled and numbered cause(s).

I further certify that the witness(es) was duly sworn by me in my capacity as an Official Court Reporter for the Supreme Court of British Columbia, Province of British Columbia; that I am not of counsel nor related to any of the counsel or any of the parties, nor in the employ of any of them, and that I have no interest in the outcome of this action(s).

S. Coutts

Stephen L. Coutts,
Official Court Reporter
gmc..

OFFICIAL COURT REPORTERS
COURT HOUSE
VANCOUVER 1, B.C.

EXHIBIT 7—W.I. Pilot

Chart 1511, plan of Courtown cays.

edge of the bank; the south-eastern extremity of the reef is steep-to. From this extremity a broken reef extends south-eastward, about half a mile within the edge of the bank, to within about one mile of the south-eastern extremity of the bank. There are depths of from 5 to 20 fathoms (9m1 to 36m6), sand, coral and rock, between this broken reef and the edge of the bank. The centre and western part of the bank are encumbered with numerous shoal patches, between which the depths are considerable.

Several cays lie on the southern part of the bank; they are composed of sand and coral stones. East cay, about 2 miles north-north-westward of the south-eastern extremity of the bank, is about 4 feet (1m2) high, and thickly covered with coconut palms. Cayo Bolivar (Middle cay), about 1¼ miles westward of East cay, is about 6 feet (1m8) high and is almost bare of vegetation except for four or five palms. West cay, about 4 cables west-north-westward of Cayo Bolivar, is very small and low. Sand cay is a small above-water sandbank, about 1¼ miles north-westward of East cay. During the turtle season, from March to August, fishermen erect huts on these cays.

Light.—A light is exhibited, at an elevation of 69 feet (21m0), from a steel tower, 59 feet (18m0) in height, situated on Cayo Bolivar (*Lat. 12° 24′ N., Long. 81° 28′ W.*).

Anchorage.—Anchorage may be found on the western edge of the bank on which Courtown cays lie, but only near its edge.

Chart 1218.

Off-lying bank.—A bank, with depths of from 30 to 50 fathoms (54m9 to 91m4), was reported, in 1946, to lie about 16 miles east-south-eastward of East cay.

Chart 1511.

ISLA SAN ANDRÉS.—Isla San Andrés (Saint Andrew island) is situated with South point, its southern extremity, about 16 miles west-north-westward of Courtown Cays light-tower; it belongs to the Republic of Colombia, and is the seat of Government of the territory comprising Isla San Andrés and Isla de Providencia (Old Providence island) together with the neighbouring cays. In 1950, the population of this group was 5,998.

A ridge of hills, rising rather abruptly on the western side, begins about 6½ cables southward of Pull point, the northern extremity of the island, and terminates about 1¾ miles northward of South point. May hill, 330 feet (100m6) high, the northern, about 2 miles south-south-westward of Pull point; Wright hill, 340 feet (103m6) high, the southern, about 2 miles northward of South point; and Lever hill, 330 feet (100m6) high, about 3 miles northward of South point, are flat elevations rising somewhat above the general level of the ridge; from northward and southward they appear as two hills. *See* view on chart. In 1904 the village of Bowie, close southward of May hill, was hidden by trees, but the white gable of the church, surmounted by a small belfry, showed above the trees. North cliff is a distinctive cliff at the northern extremity of the ridge. A radio mast stands about half a mile southward of Pull point.

The principal village is San Andrés, about one mile westward of Lawrance point, the eastern extremity of the island, situated about 1¼ miles east-south-eastward of Pull point. In 1950, the village of

from that cay, and about 8 cables farther northward is an above-water sandbank rising from a large detached drying reef.

East Cay channel is about half a mile wide at the entrance and has depths of from 7 to 10 fathoms (12m8 to 18m3) in it; but within the entrance are dark shallow coral heads which are steep-to and must be avoided. North (North-east) channel, about 3¾ miles north-north-eastward of East cay, is about half a cable wide; it has depths of 7 fathoms (12m8) and is straight.

Tidal streams.—Over the western part of the bank there are no perceptible tidal streams, but through the channels in the reefs the in-going and out-going streams attain rates of from 1½ to 2 knots.

Anchorages.—Temporary anchorage may be found, in depths of from 7 to 9 fathoms (12m8 to 16m5), white sand, half a mile north-north-westward of South-west cay (*Lat. 14° 16′ N., Long. 80° 23′ W.*).

The best anchorage in South Cay channel is, in depths of about 4½ fathoms (8m2), with Little cay bearing about 280° and South cay bearing 195°. A vessel may, however, anchor, in depths of 7 fathoms (12m8), just within the entrance in a central position between the three cays.

Small vessels may anchor close within the entrance to East Cay channel, in depths of from 7 to 9 fathoms (12m8 to 16m5), about 6 cables east-north-eastward of East cay.

For all these anchorages local knowledge is necessary.

QUITA SUEÑO BANK.—This bank is situated with the northern extremity of the reef on it about 45 miles west-north-westward of South-west cay on Serrana bank; it is dangerously steep-to especially on its eastern side. About one mile within its eastern edge a coral reef, which is above water in places, extends about 23 miles southward from its northern end. Depths of 10 to 20 fathoms (18m3 to 36m6), coral sand, extend about 6 miles northward from the northern end of the reef, and depths of from 10 to 55 fathoms (18m3 to 100m6), coral sand, extend about 2 miles southward and 10 miles west-south-westward from the southern end of the reef. The only break in the reef lies near the middle, through which a boat, with local knowledge, might pass. Westward of the reef depths of less than 20 fathoms (36m6) extend about 8 miles off the northern portion and about 12 miles off the southern portion.

The area for about 2½ miles westward of the reef is encumbered with dangerous rocky patches, and abreast the middle part a spit of shallow rocky ground extends nearly 6 miles westward. This foul ground is not safe even for boats, as the heavy surf so disturbs the sand on the bottom that the shoals are not easily distinguished.

According to a report received in 1926 the only objects visible above water on this bank were the light-tower near its northern end, and a small sharp-pointed rock about 8 miles southward of the light-tower. Depths of from 7 to 15 fathoms (12m8 to 27m4) were found from 4 to 7 miles eastward of the charted position of the eastern edge of the bank.

In 1906, the *s.s. Aureola* took the ground on a shoal, over which depths of from 17 to 22 feet (5m2 to 6m7) were obtained, situated about 14 miles west-south-westward of the light-tower.

In 1910 the *s.s. Rose Lea* took the ground on a coral head, with

Chart 1218.

a depth of $2\frac{3}{4}$ fathoms (5^m0) over it, about 12 miles south-westward of the light-tower.

Caution.—Most of this description is taken from a survey carried out in 1833.

Light.—A light (*Lat. 14° 29′ N., Long. 81° 08′ W.*) is exhibited, at an elevation of 45 feet (13^m7), from a white tower with black lantern and a black and white diamond daymark on a tank, situated close to the northern extremity of the drying reef on Quita Sueño bank.

Anchorage.—The bank westward of the foul rocky ground has depths of from 10 to 15 fathoms (18^m3 to 27^m4), coral sand, over it, and affords good anchorage; the sea being broken by the reef.

Chart 486.

NEW BANK.—New bank, or Bajo Nuevo, with depths of less than 100 fathoms (182^m9) over it, extends about 15 miles east-north-eastward from a position about 130 miles north-eastward of South-west cay on Serrana bank. It is the easternmost of the outlying banks, and on it lie East and West reefs. The south-western end of the bank has not been surveyed, and its extension south-westward remains to be determined.

East reef, which lies at the north-eastern end of the bank, is semi-circular in shape and steep-to on its northern and eastern sides, but depths of less than 20 fathoms (36^m6) extend about one mile north-eastward from it. A dry sand bore or cay, from which rocky heads extend about 2 miles north-westward, is situated at its south-western end. The north-western extremity of the drying reef lies about $2\frac{1}{2}$ miles northward of the sand bore and the eastern extremity of the reef is about the same distance north-eastward. The area within this reef is full of rocky heads.

West reef extends about $6\frac{1}{2}$ miles along the south-eastern side of the bank, south-westward of East reef, from which it is separated by an opening about one mile wide. There are charted depths of from 9 to 13 fathoms (16^m5 to 23^m8) in this opening, but it has not been thoroughly examined, and should not be attempted without local knowledge. A sand bore or cay is situated at the south-western extremity of West reef, and a shallow ledge, with rocky heads, extends about 2 cables westward from it. Small ridges of sand occasionally form on other parts of the reef but they disappear in strong breezes.

Low cay (*Lat. 15° 52′ N., Long. 78° 39′ W.*), situated at the northern end of West reef, is barren, composed of sand, broken coral and drift-wood thrown up by the sea to a height of about 5 feet (1^m5), with a small pond on it.

North-westward of East reef the bank is clear of known dangers for nearly one mile within its edge. There is also a clear space on the bank, about 2 miles westward of Low cay, which is about 3 miles wide and extends to the south-western extremity of the bank; there are depths of from 7 to 17 fathoms (12^m8 to 31^m1), coral sand, in this area.

In the months of March and April, the bank is visited by seal-fishing vessels from Isla San Andrés (Saint Andrew island) and Isla de Providencia (Old Providence island).

Anchorages.—In moderate weather anchorage may be obtained in depths of 8 fathoms (14^m6), with Low cay bearing about 100°, distant $1\frac{1}{2}$ miles; but it is exposed to northerly breezes. Caution

EXHIBIT 7a—Supp. Pilot 1968

Page 352.—Lines 49-50: *delete* "A radio" to "point." and *substitute:*—
A light for the use of aircraft is exhibited from a radio tower situated about 5 cables southward of Pull point; its charted position is approximate. A radio mast, about 100 feet (30^{m}5) in height and marked by a *red fixed* air obstruction light, is reported to stand northward of the radio tower.

Page 353.—Lines 52-54: *Delete* and *substitute:*—
A black conical light-buoy exhibiting a *white flashing* light *every five seconds* is moored about 5 cables southward of Haine cay.
A red conical light-buoy exhibiting a *red flashing* light *every three seconds* is moored 4½ cables westward of Haine cay.

Page 355.—*After* line 30 *insert:*—
Bank.—A bank, with a depth of 33 fathoms (60^{m}4) over it, was reported in 1966 to lie 20 miles west-south-westward of the light on Roncador cay.

Page 361.—*After* line 49 *insert:*—
A stranded wreck, which is radar conspicuous, lies about 9 miles southward of Quita Sueño light-tower; its charted position is approximate.
The following dangers, their positions given from the light-tower, were reported in 1967: a 42-foot (12^{m}8) shoal, 8 miles south-eastward; a 65-fathom (118^{m}9) bank, 5¾ miles eastward; a 60-foot (18^{m}3) shoal, 13½ miles northward and a 14-fathom (25^{m}6) bank, 15 miles north-north-westward.

Page 362.—*After* line 3 *insert:*—
In 1964, a depth of 10 fathoms (18^{m}3) was reported about 38 miles west-north-westward, and a depth of 11 fathoms (20^{m}1) about 36 miles north-westward, respectively, of Quita Sueño light-tower. Reported shoal depths which lie about 55 miles north-north-westward of the light-tower are referred to on page 391.
Line 20: *Add:*—Depths of 12 feet (3^{m}7) are reported to extend up to 10 miles westward of New bank.
After line 29 *insert:*—
A conspicuous stranded wreck lies on the southern end of East reef.

Page 365.—*After* line 34 *insert:*—
For banks south-westward of Rosalind bank, *see* page 391.
Lines 41-49: *Delete.*

Page 370.—Line 11: *Delete* "In" to "27,005."
Line 12: *Add:*—In 1965, the population was 19,616.

Page 380.—*After* line 15 *insert:*—
In 1964, a stranded wreck, situated on the edge of the drying reef about 11 cables north-westward of Downs point, was reported to afford a good radar target.
After line 25 *insert:*—
A conspicuous building, illuminated at night, stands at the head of Brig bay. Two small piers extend from the shore near the building.
After line 39 *insert:*—
A conspicuous building, illuminated at night, stands at the head of South-west bay; an airstrip runs north-north-eastward from this building.

EXHIBIT 8—British Admiralty Notice to Mariners No. 43

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No. 43. WEEKLY EDITION

The substance of these Notices **which are for the use of H.M. Ships and Merchant Ships,** should be inserted on the Charts affected. Sections IV, V and VI should be cut up and pasted in the appropriate Admiralty Publications. Permanent Notices in Section II are not to be cut up, but the books are to be annotated in the margin or corrected in manuscript. Temporary and Preliminary Notices may be filed for easy reference.

ADMIRALTY NOTICES TO MARINERS

Week ending 30th October, 1971.

Notice Nos. **1631** *to* **1679.**

Geographical positions refer direct to the graduations of the largest scale chart unless otherwise stated. Bearings are referred to the true compass and are reckoned clockwise from 000° (North) to 359°; those relating to lights are from seaward. Visibility of lights is that in clear weather. The abbreviation "(U)" for "Unwatched" is no longer being inserted on Admiralty charts nor in Admiralty List of Lights. Depths are with reference to datum of largest scale chart. Heights are above mean high water springs, or mean higher high water, as appropriate. The capital letter **(P)** *or* **(T)** *after the number of any Notice denotes Preliminary or Temporary respectively.*

N O T E.—Blocks and Notes are shown after Section IV.

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II. Admiralty Notices to Mariners.

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†IV. Amendments to NEMEDRI, CHINPACS and Notice to Mariners No. 18 (Areas dangerous due to Mines).

V. Corrections to Admiralty List of Lights and Fog Signals.

VI. Corrections to Admiralty List of Radio Signals and Notices to Mariners Nos. 3, 3A & 3B (Official Radio Messages to British Merchant Ships).

† Mined areas are not printed on charts, except in the Baltic.

Taunton.

G. P. D. HALL, *Rear-Admiral,*
Hydrographer of the Navy.

Mariners are particularly requested to notify the Hydrographer of the Navy, Hydrographic Department, Ministry of Defence, Taunton, Somerset, immediately on the discovery of new dangers or suspected dangers to navigation, and of changes or defects in aids to navigation.

Copies of these Notices can be obtained **gratis** *by Masters of foreign going ships from Mercantile Marine Offices in the United Kingdom. Copies may also be inspected at British Commonwealth Government Shipping Offices and at British Consulates.*
See Annual Notice No. 14.

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1678. **LIST OF HYDROGRAPHIC PUBLICATIONS PUBLISHED AND UNDER REVISION AND NOTICES AFFECTING SAILING DIRECTIONS ONLY.**

(*Revised and republished monthly*).

(*Former Notice* 1505/71 cancelled).

(1) SAILING DIRECTIONS (*a*) **New Sailing Directions**

The Mariner's Handbook, 3rd Edition, 1971 (N.P. 100).
East Coast of Central America, etc. Pilot, 1st Edition 1970 (N.P. 69A).
Channel Pilot, 1st Edition, 1971 (N.P. 27).
(*comprising The Channel westward of Selsey Bill and Le Havre*).

(b) New Supplements

No. 5 to Mediterranean Pilot, Vol. I (N.P. 45).

(c) Books in the Press

Dover Strait Pilot, 1st Edition, 1971 (N.P. 28).
(*comprising Dover Strait from Selsey Bill and Le Havre to Scheveningen and Orford Ness*).
New Zealand Pilot, 13th Edition, 1971 (N.P. 51).
South Indian Ocean Pilot, 8th Edition, 1971 (N.P. 69).

(d) Supplements in the Press

No. 5 to Baltic Pilot, Vol. III (N.P. 20).
No. 7 to Arctic Pilot, Vol. III (N.P. 12).
No. 2 to British Columbia Pilot, Vol. II (N.P. 26).
No. 3 to Japan Pilot, Vol. I (N.P. 41).
No. 3 to Japan Pilot, Vol. III (N.P. 42B).
No. 7 to South America Pilot, Vol. I (N.P. 5).
No. 2 to China Seas Pilot, Vol. III (N.P. 32).
No. 5 to China Seas Pilot, Vol. I (N.P. 30).
No. 6 to Australia Pilot, Vol. IV (N.P. 16).
No. 2 to Eastern Archipelago Pilot, Vol. III (N.P. 35).
No. 3 to Africa Pilot, Vol. I (N.P. 47).
No. 1 to Mediterranean Pilot, Vol. III (N.P. 1).
No. 1 to Dover Strait Pilot (N.P. 28).
No. 1 to Bay of Biscay Pilot (N.P. 22).
No. 4 to Eastern Archipelago Pilot, Vol. IV (N.P. 35).
No. 7 to East Coast of United States Pilot, Vol. I (N.P. 68).
No. 2 to South America Pilot, Vol. III (N.P. 7).
No. 8 to West Coast of Scotland Pilot (N.P. 66).
No. 1 to Pacific Islands Pilot, Vol. I (N.P. 60).
No. 2 to Mediterranean Pilot, Vol. IV (N.P. 48).

[*Continued*

EXHIBIT 8—British Admiralty Notice to Mariners No. 44

No. 44. WEEKLY EDITION

The substance of these Notices which are for the use of H.M. Ships and Merchant Ships, should be inserted on the Charts affected. Sections IV, V and VI should be cut up and pasted in the appropriate Admiralty Publications. Permanent Notices in Section II are not to be cut up, but the books are to be annotated in the margin or corrected in manuscript. Temporary and Preliminary Notices may be filed for easy reference.

ADMIRALTY NOTICES TO MARINERS

Week ending 6th November, 1971.

Notice Nos. **1680** *to* **1739; Aus 281.**

Geographical positions refer direct to the graduations of the largest scale chart unless otherwise stated. Bearings are referred to the true compass and are reckoned clockwise from 000° (North) to 359°; those relating to lights are from seaward. Visibility of lights is that in clear weather. The abbreviation "(U)" for "Unwatched" is no longer being inserted on Admiralty charts nor in Admiralty List of Lights. Depths are with reference to datum of largest scale chart. Heights are above mean high water springs, or mean higher high water, as appropriate. The capital letter (P) *or* (T) *after the number of any Notice denotes Preliminary or Temporary respectively.*

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† Mined areas are not printed on charts, except in the Baltic.

G. P. D. HALL, *Rear-Admiral,*
Hydrographer of the Navy.

Taunton.

Mariners are particularly requested to notify the Hydrographer of the Navy, Hydrographic Department, Ministry of Defence, Taunton, Somerset, immediately on the discovery of new dangers or suspected dangers to navigation, and of changes or defects in aids to navigation.

Copies of these Notices can be obtained **gratis** *by Masters of foreign going ships from Mercantile Marine Offices in the United Kingdom. Copies may also be inspected at British Commonwealth Government Shipping Offices and at British Consulates. See Annual Notice No 14.*

(8) New Chart to be Published Shortly.

Chart.		Charts superseded.
5374	The World, Magnetic Variation 1970 and Annual Rates of Change.	5374

(9) New Editions and Large Corrections to be Published Shortly.

1427	North America, W. Coast, Puget Sound, Lake Washington Ship Canal and Seattle Harbour. Puget Sound, Tacoma Harbour. Puget Sound, Everett Harbour.	New Edition.
2289	North Sea, Skagerrak.	Large Correction.
L(D7) 2289	Hirtshals Havn.	

1733. **ADMIRALTY PUBLICATIONS — Underwater Handbook, Western Approaches to the British Isles (N.P. 625).**

The Underwater Handbooks are a new series of volumes produced by the Hydrographer of the Navy. The aim of the series is to collate and present in one volume oceanographic, meteorological and certain miscellaneous data pertaining to a specific area. The data which are for use primarily in Naval planning, have an application in other maritime operations.

The first volume of the series, "South China and Java Seas" (NP 623), covering an area 11°S to 22°N and 100°E to 120°E, was published in 1969, price £2·50. The second volume "Western Approaches to the British Isles" (NP 625), covering an area 43°N to 58°N and 5°W to 32°W, is now available, price £3·50.

Hydrographic Department. (*H. 1413/71.*)

1734. **ADMIRALTY PUBLICATIONS — Admiralty List of Radio Signals, Volume 2, 1971 (Radiobeacons etc.) [N.P. 275(2)].**

The above volume, price £1·70, has been published, together with a Special Recapitulatory Supplement containing corrections received while this publication was in the press. The 1969 edition is thereby cancelled. No further corrections will be issued for the 1969 edition.

Changes have been made in the detailed presentation of the volume as compared with previous editions. Apart from the change to an International Standard paper size (210 × 297mm./8·27 × 11·69 inches), the station details have been simplified and reduced to essential information required by the user. All beacons, including Aero Radiobeacons, are listed in geographical sequence and have been allotted new station numbers. This has permitted a layout generally in columns, giving, it is hoped, improved readability.

The Radiobeacon Diagrams have been re-drawn and simplified, and are NOT included in Volume 2, but are issued as a separate publication [NP 275(2a)], price 26p.

Hydrographic Department. (*H. 3938/71.*)

EXHIBIT 8—British Admiralty Notice to Mariners No. 48

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No. 48. WEEKLY EDITION

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ADMIRALTY NOTICES TO MARINERS

Week ending 4th December, 1971.

Notice Nos. **1870** *to* **1920.**

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G. P. D. HALL, *Rear-Admiral,*
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II

(e) Books under Revision

Malacca Strait Pilot, 4th Edition, 1958 (N.P. 44).
Ocean Passages of the World, 2nd Edition, 1950 (N.P. 136).
Australia Pilot, Vol. V, 5th Edition, 1959 (N.P. 17).
South America Pilot, Vol. II, 4th Edition, 1956 (N.P. 6).
Nova Scotia and Bay of Fundy Pilot, 10th Edition, 1958 (N.P. 59).
Australia Pilot, Vol. III, 5th Edition, 1960 (N.P. 15).
Baltic Pilot, Vol. 1, 8th Edition, 1959 (N.P. 18).
West Coasts of Spain, etc. Pilot, 4th Edition, 1957 (N.P. 67).
West Indies Pilot, Vol. III, 5th Edition, 1957 (N.P. 72).
Australia Pilot, Vol. IV, 5th Edition, 1962 (N.P. 16).
North Sea Pilot, Vol. III, 12th Edition, 1960 (N.P. 54).
West Coast of England Pilot, 10th Edition, 1960 (N.P. 37).
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Vol. II (N.P. 275(2)).

(b) Books in the Press

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(c) Books under Revision

Vol. III (N.P. 275(3)).

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EXHIBIT 10—Radio Signals Book

Sixth Ed J
4/9/72

N.P. 275(2)

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ADMIRALTY LIST
OF
RADIO SIGNALS
VOLUME II
1969

RADIO DIRECTION FINDING STATIONS
RADIOBEACONS
COAST RADAR STATIONS
RADAR BEACONS

This volume should be corrected each week from Section VI of the Weekly Edition of Admiralty Notices to Mariners until superseded

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1969

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DIRECTIONS FOR CORRECTING THE ADMIRALTY LIST OF RADIO SIGNALS

This edition contains all information received up to 26th April, 1969. Subsequent corrections will be included in Section VI of the Weekly Edition of Admiralty Notices to Mariners. The number of each Weekly Edition should be recorded below as it is incorporated in this volume.

1969

27.....	32.....	37.....	42.....	47..M.S.....	52..M.S.....
28.....	33.....	38.....	43.....	48..M.S.....	53..M.S.....
29.....	34.....	39.....	44.....	49..M.S.....	
30.....	35.....	40.....	45..Supp.....	50..M.S.....	
31.....	36.....	41.....	46..M.S.....	51..M.S.....	

1970

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2..M.S.....	11..M.S.....	20..M.S.....	29..M.S.....	38..J.Z.K.	47..J.Z.K.
3..M.S.....	12..M.S.....	21..M.S.....	30..M.S.....	39..J.Z.K.	48..J.Z.K.
4..M.S.....	13..M.S.....	22..M.S.....	31..M.S.....	40..J.Z.K.	49..J.Z.K.
5..M.S.....	14..M.S.....	23..M.S.....	32..M.S.....	41..J.Z.K.	50..J.Z.K.
6..M.S.....	15..M.S.....	24..M.S.....	33..M.S.....	42..J.Z.K.	51..J.Z.K.
7..M.S.....	16..M.S.....	25..M.S.....	34..M.S.....	43..J.Z.K.	52.....
8..M.S.....	17..M.S.....	26..M.S.....	35..M.S.....	44..J.Z.K.	53.....
9..M.S.....	18..M.S.....	27..M.S.....	36..M.S.....	45..J.Z.K.	

1971

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2..J.Z.K.	11..M.Z.K.	20..M.Z.K.	29..M.Z.K.	38..M.Z.K.	47.....
3..J.Z.K.	12..M.Z.K.	21..M.Z.K.	30..M.Z.K.	39..M.Z.K.	48.....
4..J.Z.K.	13..M.Z.K.	22..M.Z.K.	31..M.Z.K.	40..M.Z.K.	49.....
5..J.Z.K.	14..M.Z.K.	23..M.Z.K.	32..M.Z.K.	41..M.Z.K.	50.....
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ADMIRALTY LIST OF RADIO SIGNALS

VOLUME I

This Volume contains particulars of: Coast Radio Stations; Medical Advice by Radio; Epidemiological Bulletins; and the " Amver " Organization. It also contains Regulations for the use of Radio in Territorial Waters, arrangements for Quarantine Reports and Locust Reports, and a brief extract from the International Radio Regulations.

VOLUME II

This Volume contains particulars of: Radio Direction Finding Stations; Radiobeacons (including Aero Radiobeacons in coastal regions); Calibration Stations (i.e. stations giving special transmissions for the calibration of ships' D/F); Coast Radar Stations providing navigational assistance; and Radar Beacons (Racons and Ramarks). Lists of Coast Radio Stations which give " QTG " service are also included.

VOLUME III

This Volume contains particulars of Radio Weather Messages, Facsimile Transmissions, and certain Meteorological Codes provided for the use of shipping.

VOLUME IV

This Volume contains the list of Meteorological Observation Stations.

VOLUME V

This Volume contains particulars of: Radio Time Signals; Standard Frequency Services; Standard Times; Radio Navigational Warnings (including relevant Codes and Regulations, and Ice Reports); and Position Fixing Systems (Loran, Consol, and Decca).

PORT RADIO STATIONS AND PILOT VESSELS

This Volume contains particulars of Stations specifically established to aid vessels entering Ports, to assist in Berthing etc., and to Control Traffic in congested waterways.

R/T VOLUME

This Volume contains particulars of the Radio Telephony transmissions from Port Radio and Coast Radio Stations, together with the Radio Navigational Aids available, for the coasts of the Northern North Atlantic Ocean and the Western Mediterranean Sea.

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PREFACE

This edition of the Admiralty List of Radio Signals, Volume II, contains information received up to 26th April, 1969, and supersedes the 1966 edition of Volume II. All subsequent corrections to this list will be included in Section VI of the Weekly Edition of Admiralty Notices to Mariners, copies of which can be obtained *gratis* from the Agents for the sale of Admiralty Charts.

Mariners and others are invited in the interests of navigation to forward to The Hydrographer of the Navy any information that may come to their notice, which would be useful for the correction of Charts and other Hydrographic Publications; early advice as to newly-discovered dangers, and of the establishment of, or changes in, any aids to navigation, is specially requested. A copy of a form H. 102, on which to render information, is bound in the Weekly Editions of Notices to Mariners; these forms can be obtained *gratis* from the Hydrographer of the Navy, or from any of the Agents in Great Britain and abroad, a list of whom will be found in Admiralty Notice to Mariners No. 2.

G. S. RITCHIE,
Hydrographer of the Navy.

Taunton,
Somerset.
26th April, 1969.

GENERAL INFORMATION

The following details apply to Volumes I, II, III and V of the List of Radio Signals, except where otherwise stated.

FREQUENCY: 500. A2. 2 kW. signifies RADIO FREQUENCY 500 kilocycles per second, TYPE A2, POWER 2 kilowatts.

TIMES quoted are, unless otherwise stated, in Greenwich Mean Time (G.M.T.) and the hours are reckoned from 0000 (midnight) to 2359.

BEARINGS are true, expressed in degrees from 000° (North) to 359°, measured clockwise.

GEOGRAPHICAL POSITIONS of coast stations are normally as given by the controlling authority; in some cases they are in accordance with the Admiralty chart. Coast stations are shown on Chart No. 5033 (Telegraph Chart of the World). If bearings are taken to coast stations it should be remembered that, in many cases, the positions quoted are only approximate.

NAMES OF STATIONS: The word " Radio " forms an integral part of the name of any coast station for transmission purposes: thus " Portishead " should invariably be addressed as " Portishead Radio ", and so on.

SPELLINGS OF NAMES OF STATIONS: Where the name of a station is that of the *place* at which the station is situated, the spelling accepted as correct for use in Admiralty publications will in future be adopted; in other cases, the spelling given in the relevant International List (or supplied by the country concerned) will be retained; but the accepted name of the *place* may be added for information. (At the present time, however, the spellings used in Vols. I, III and V are generally as given in the relevant International List.) In Vol. II, other versions appearing on Admiralty charts are given in addition to the currently accepted forms, in order to provide for the use of the List in conjunction with charts on which the names have not yet been corrected.

TEMPORARY ALTERATIONS: For the practice adopted in respect of this volume in regard to temporary alterations, see the introductory portion of the Radiobeacons Section, under the heading *Notes* (*temporary*), in section headed Definitions and General Information.

FOR FURTHER GENERAL DETAILS and explanatory notes the introduction to each section of the book should be consulted.

DIRECTIONS FOR CORRECTING THE ADMIRALTY LIST OF RADIO SIGNALS

The list should be kept corrected from the Weekly Edition of the Notices to Mariners (*see* PREFACE).

A marginal reference to the relevant Weekly Edition should be inserted in this volume. Minor amendments may be made in manuscript.

For convenience in recording the correctional material used a tabulation is provided on the fly-leaf at the front of this volume.

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ABBREVIATIONS

The following list explains the meanings of certain abbreviations used in this volume.

A.L.R.S.	Admiralty List of Radio Signals.
A0	Continuous waves, unmodulated.
A1	Continuous waves, unmodulated, with on-off keying.
A2	Continuous waves, amplitude modulated at audible frequency with keyed signals.
A3	Continuous waves: amplitude modulated R/T.
B	Damped (i.e. Spark) waves.
Cal.	Calibration.
c/s	Cycles per second.
D/F	Direction Finder *or* Direction Finding.
ext.	Extension (telephone).
F3	Continuous waves: frequency modulated R/T.
G.M.T.	Greenwich Mean Time.
H+....	Commencing at .... min. past the hour.
inop.	Inoperative (out of service).
I.T.U.	International Telecommunication Union.
kc/s	Kilocycles per second.
kW	Kilowatts.
Lt. Ho.	Lighthouse (used of any light-structure).
Lt. V.	Light-Vessel.
L/F	Low Frequency.
min.	Minutes.
M/F	Medium Frequency.
Mc/s	Megacycles per second.
Occas.	Occasional.
O.W.S.	Ocean Weather Ship.
P.A.	Position Approximate.
P/L	Plain language.
P.P.I.	Plan Position Indicator (radar screen).
P.V.	Pilot Vessel.
QTG	See page 68.
Repd.	Reported.
R.R.	Radio Range (see page 67).
R/T	Radio Telephone *or* Radio Telephony.
Rx	Receiver.
sec.	Seconds.
S.H.F.	Super High Frequency.
Sig.	Signal.
Stn.	Station.
T.	Temporarily.
Tel.	Telephone.
Tx	Transmitter.
W/T	Wireless Telegraphy.

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The following publications (and subsequent supplements) were consulted and used in the preparation of this volume:—

Cuaderno de Faros (Mexico).
Dansk Fyrliste (Copenhagen).
International Radio Regulations (Geneva).
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Lichtenlijst van Nederland (The Hague).
List of Call Signs (Geneva).
List of Coast Stations (Geneva).
List of Japanese Coast and Ship Stations (Tokyo).
List of Radiodetermination and Special Service Stations (Geneva).
Lista de Auxílios-Rádio (Brazil).
Lista de Ajudas à Navegaçao (Portugal).
Liste des Feux (Oostende).
Nautischer Funkdienst (Hamburg).
Nautischer Funkdienst (Rostock).
New Zealand Nautical Almanac (Wellington).
New Zealand Port Information Manual (Wellington).
Norsk Fyrliste (Oslo).
Radio Aids to Marine Navigation (Dept. of Transport, Ottawa).
Radio Ayudas a la Navegación (Valparaiso).
Radioayudas a la Navegación (Buenos Aires).
Radio Navigational Aids (U.S. Oceanographic Office, Washington).
Radioseñales (Cadiz).
Radioseñales (Uruguay).
Radioservizi per la Navigazione (Genoa).
Radiosignaux à l'Usage des Navigateurs (Paris).
Skrá yfir Vita og Sjómerki á Íslandi (Reykjavík).
South African List of Lights.
Spis Latarń i Sygnalów Nawigacyjnych (Warsaw).
Suomen Rannikon Loistot (Helsinki).
Svensk Fyrlista (Stockholm).
United States Coast Guard Light List.
U.S.S.R. Sailing Directions.

In addition to the above, the Air Information Publications, Flight Information Publications, and Notams (Notices to Airmen), issued by various civil and military aviation authorities, too numerous to be specified here, were consulted in respect of Aero Radiobeacons.

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INTERNATIONAL ALLOCATION OF CALL SIGNS

International Telecommunication Union, Geneva, 1959

Call Signs	Country	Call Signs	Country
AAA—ALZ	United States of America	JWA—JXZ	Norway
AMA—AOZ	Spain	JYA—JYZ	Jordan
APA—ASZ	Pakistan	JZA—JZZ	West New Guinea
ATA—AWZ	India	KAA—KZZ	United States of America
AXA—AXZ	Australia	LAA—LNZ	Norway
AYA—AZZ	Argentina	LOA—LWZ	Argentina
A2A—A2Z	Botswana	LXA—LXZ	Luxemburg
BAA—BZZ	China	LYA—LYZ	Lithuania
CAA—CEZ	Chile	LZA—LZZ	Bulgaria
CFA—CKZ	Canada	MAA—MZZ	United Kingdom
CLA—CMZ	Cuba	NAA—NZZ	United States of America
CNA—CNZ	Morocco	OAA—OCZ	Peru
COA—COZ	Cuba	ODA—ODZ	Lebanon
CPA—CPZ	Bolivia	OEA—OEZ	Austria
CQA—CRZ	Portuguese Overseas Provinces	OFA—OJZ	Finland
CSA—CUZ	Portugal	OKA—OMZ	Czechoslovakia
CVA—CXZ	Uruguay	ONA—OTZ	Belgium
CYA—CZZ	Canada	OUA—OZZ	Denmark
DAA—DTZ	Germany	PAA—PIZ	Netherlands
DUA—DZZ	Philippines	PJA—PJZ	Netherlands Antilles
EAA—EHZ	Spain	PKA—POZ	Indonesia
EIA—EJZ	Irish Republic	PPA—PYZ	Brazil
EKA—EKZ	U.S.S.R.	PZA—PZZ	Suriname
ELA—ELZ	Liberia	QAA—QZZ	(Service abbreviations)
EMA—EOZ	U.S.S.R.	RAA—RZZ	U.S.S.R.
EPA—EQZ	Iran	SAA—SMZ	Sweden
ERA—FRZ	U.S.S.R.	SNA—SRZ	Poland
ESA—ESZ	Estonia	SSA—SSM	Egypt
ETA—ETZ	Ethiopia	SSN—STZ	Sudan
EUA—EWZ	Bielorussian S.S.R.	SUA—SUZ	Egypt
EXA—EZZ	U.S.S.R.	SVA—SZZ	Greece
FAA—FZZ	France, etc.*	TAA—TCZ	Turkey
GAA—GZZ	United Kingdom	TDA—TDZ	Guatemala
HAA—HAZ	Hungary	TEA—TEZ	Costa Rica
HBA—HBZ	Switzerland	TFA—TFZ	Iceland
HCA—HDZ	Ecuador	TGA—TGZ	Guatemala
HEA—HEZ	Switzerland	THA—THZ	France, etc.*
HFA—HFZ	Poland	TIA—TIZ	Costa Rica
HGA—HGZ	Hungary	TJA—TJZ	Cameroun
HHA—HHZ	Haiti	TKA—TKZ	France, etc.*
HIA—HIZ	Dominican Republic	TLA—TLZ	Central African Republic
HJA—HKZ	Colombia	TMA—TMZ	France, etc.*
HLA—HMZ	Korea	TNA—TNZ	Congo (Brazzaville)
HNA—HNZ	Iraq	TOA—TQZ	France, etc.*
HOA—HPZ	Panama	TRA—TRZ	Gabon
HQA—HRZ	Honduras	TSA—TSZ	Tunisia
HSA—HSZ	Thailand	TTA—TTZ	Chad
HTA—HTZ	Nicaragua	TUA—TUZ	Ivory Coast
HUA—HUZ	El Salvador	TVA—TXZ	France, etc.*
HVA—HVZ	Vatican City State	TYA—TYZ	Dahomey
HWA—HYZ	France, etc.*	TZA—TZZ	Mali
HZA—HZZ	Saudi Arabia	UAA—UQZ	U.S.S.R.
IAA—IZZ	Italy	URA—UTZ	Ukrainian S.S.R.
JAA—JSZ	Japan	UUA—UZZ	U.S.S.R.
JTA—JVZ	Mongolia	VAA—VGZ	Canada
		VHA—VNZ	Australia

* France and Group of Territories represented by the French Overseas Post and Telecommunication Agency.

Call Signs	Country
VOA—VOZ	Canada
VPA—VSZ	British Territories*
VTA—VWZ	India
VXA—VYZ	Canada
VZA—VZZ	Australia
WAA—WZZ	United States of America
XAA—XIZ	Mexico
XJA—XOZ	Canada
XPA—XPZ	Denmark
XQA—XRZ	Chile
XSA—XSZ	China
XTA—XTZ	Upper Volta
XUA—XUZ	Cambodia
XVA—XVZ	Vietnam
XWA—XWZ	Laos
XXA—XXZ	Portuguese Oversea Provinces
XYA—XZZ	Burma
YAA—YAZ	Afghanistan
YBA—YHZ	Indonesia
YIA—YIZ	Iraq
YJA—YJZ	New Hebrides
YKA—YKZ	Syria
YLA—YLZ	Latvia
YMA—YMZ	Turkey
YNA—YNZ	Nicaragua
YOA—YRZ	Rumania
YSA—YSZ	El Salvador
YTA—YUZ	Yugoslavia
YVA—YYZ	Venezuela
YZA—YZZ	Yugoslavia
ZAA—ZAZ	Albania
ZBA—ZJZ	British Territories*
ZKA—ZMZ	New Zealand
ZNA—ZOZ	British Territories*
ZPA—ZPZ	Paraguay
ZQA—ZQZ	British Territories*
ZRA—ZUZ	South Africa and South-West Africa
ZVA—ZZZ	Brazil
2AA—2ZZ	United Kingdom
3AA—3AZ	Monaco
3BA—3FZ	Canada
3GA—3GZ	Chile
3HA—3UZ	China
3VA—3VZ	Tunisia
3WA—3WZ	Vietnam
3XA—3XZ	Guinea
3YA—3YZ	Norway
3ZA—3ZZ	Poland
4AA—4CZ	Mexico
4DA—4IZ	Philippines
4J...—4LZ	U.S.S.R.
4MA—4MZ	Venezuela
4NA—4OZ	Yugoslavia
4PA—4SZ	Ceylon
4TA—4TZ	Peru
4UA—4UZ	United Nations
4VA—4VZ	Haiti
4WA—4WZ	Yemen
4XA—4XZ	Israel
4YA—4YZ	International Civil Aviation Organisation (I.C.A.O.)
4ZA—4ZZ	Israel
5AA—5AZ	Libya
5BA—5BZ	Cyprus
5CA—5GZ	Morocco
5HA—5IZ	Tanzania
5JA—5KZ	Colombia
5LA—5MZ	Liberia
5NA—5OZ	Nigeria
5PA—5QZ	Denmark
5RA—5SZ	Madagascar
5TA—5TZ	Mauritania
5UA—5UZ	Niger
5VA—5VZ	Togo
5WA—5WZ	Western Samoa
5XA—5XZ	Uganda
5YA—5ZZ	Kenya
6AA—6BZ	Egypt
6CA—6CZ	Syria
6DA—6JZ	Mexico
6KA—6NZ	Korea
6OA—6OZ	Somalia
6PA—6SZ	Pakistan
6TA—6UZ	Sudan
6VA—6WZ	Sénégal
6XA—6XZ	Madagascar
6YA—6YZ	Jamaica
6ZA—6ZZ	Liberia
7AA—7IZ	Indonesia
7OA—7OZ	South Yemen
7JA—7NZ	Japan
7QA—7QZ	Malawi
7RA—7RZ	Algeria
7SA—7SZ	Sweden
7TA—7YZ	Algeria
7ZA—7ZZ	Saudi Arabia
8AA—8IZ	Indonesia
8JA—8NZ	Japan
8OA—8OZ	Botswana
8PA—8PZ	Barbados
8QA—8QZ	Maldive Islands
8RA—8RZ	Guyana
8SA—8SZ	Sweden
8TA—8YZ	India
8ZA—8ZZ	Saudi Arabia
9AA—9AZ	San Marino
9BA—9DZ	Iran
9EA—9FZ	Ethiopia
9GA—9GZ	Ghana
9HA—9HZ	Malta
9IA—9JZ	Zambia
9KA—9KZ	Kuwait
9LA—9LZ	Sierra Leone
9MA—9MZ	Malaysia
9NA—9NZ	Nepal
9OA—9TZ	Congo (Kinshasa)
9UA—9UZ	Burundi
9VA—9VZ	Singapore
9WA—9WZ	Malaysia
9XA—9XZ	Rwanda
9YA—9ZZ	Trinidad and Tobago

* Overseas Territories for the international relations of which the Government of the United Kingdom of Great Britain and Northern Ireland are responsible.

ALPHABETICAL LIST OF CALL SIGNS

This list comprises the call signs of:

1. Radio direction finding stations and their associated call stations.
2. Radio stations providing " QTG " service (indicated by page references).
3. Marine radiobeacon stations, calibration stations, radar stations, and radar beacon stations, which can be called by ships at sea, either direct or via a radio station *in the same locality*.

NOTE.—(1) For International Allocation of Call Signs, see preceding pages.

(2) For Identification Signals of marine and aero-marine radiobeacons, see page 77 *et seq.*

(3) For system of numbering of stations, see page 528.

Call Sign	Station	Station No. or Page
ASC	Chittagong ...	1422E
ASK	Karachi	1416
ASV1	Hiran Point ...	2421F
AXA	Troughton Islet ...	1586F 2586F
CBF	Juan Fernández ...	p. 416
CBI	Iquique	p. 416
CBM	Magallanes ...	p. 416
CBP	Puerto Montt ...	p. 416
CBS	San Pedro... ...	p. 416
CBT	Talcahuano ...	p. 416
CBU	Guafo	p. 416
CBV	Valparaíso ...	p. 416
CBY	Isla de Pascua ...	p. 382
CTC	Cascais	1241
CTI	Boa Nova... ...	1238D
CTN3 CTN6	Apúlia	1237E
CTS	Sagres	1244
CWM	Montevideo ...	2820
CWM21	Cabo Polonio ...	2822
CWM26	Isla de Lobos ...	2820B
DAE	Elbe–Weser ...	1088J
DAG	St. Peter—Ording	1092
DAN	Norddeich ...	1086C p. 122
DAO	Kiel	p. 138
DAQ	Norddeich... ...	1086C
DCA	Weser Lt. V. ...	2087E
DCD	P 8 Lt. V.... ...	2086M
DCF	Borkumriff Lt. V.	2085L
DCH	Elbe No. 1 Lt. V.	2088
DCL	Fehmarnbelt Lt. V.	2121
DHS	Rügen	p. 138
EJK	Valencia	p. 111
EJM	Malin Head ...	p. 111
GCC	Cullercoats ...	p. 106
GIL	Ilfracombe ...	p. 106
GKR	Wick	p. 106
GKZ	Humber	p. 106
GLD	Land's End ...	p. 106
GLV	Anglesey	p. 106
GMW	Muscat	p. 269
GND	Stonehaven ...	p. 106
GNE	Oban	p. 106
GNF	North Foreland ...	p. 106
GNI	Niton	p. 106
GNV	Bahrain	p. 270
GPK	Portpatrick ...	p. 106
HPK	Almirante ...	2781C
HRC	Tela	2776D
HRG	Puerto Cortéz ...	2776
ICA	Ancona	1290E
ICT	Taranto	1285E
IDC	Cagliari	1271G
IFA	Pula	1271G
IGK	Borgo Piave ...	1285E
IGQ	Sottomarina ...	1290E
IQX	Trieste	1290E
JCF	Niigata	p. 331
JCG	Shimonoseki ...	p. 331
JCK	Kobe	p. 331
JCS	Choshi	p. 331

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Call Sign	Station	Station No. or Page
JCY	Yokohama ...	p. 331
JHK	Hakodate	p. 331
JIT	Ōita	p. 331
JLA	Nojima Saki ...	2484 8484
JLF	Esan Misaki ...	2463F
JLH	Inubō Saki ...	2485E 8485E
JLI	Ō Shima	2481
JLJ	Irō Saki	2480E
JLT	Hachijō Shima ...	2480H
JMA	Maizuru	p. 331
JOS	Nagasaki	p. 331
JSM	Shionomisaki ...	p. 331
KRDV	Minā' Saud ...	p. 270
KVR	St. Paul I. ...	2649
LGD	Rørvik	p. 190
LGH	Harstad	p. 190
LGQ	Rogaland	1192D
LGT	Tjøme	p. 190
LGV	Vardø	p. 190
LGZ	Farsund	1187F p. 190
LHHT	Met. Ship "Famita"	2210F
LJB	Bjørnøya	2981
LMJ	Jan Mayen ...	p. 506
LML	Isfjord	2980 p. 505 7980
LZL	Burgas	p. 234
MRGK	Ying-k'ou	1450D
MRGL	Hu-lu-tao	1450
NDLZ	U.S. O.W.S. (Pacific) ...	—
NMMZ	U.S. O.W.S. (Atlantic) ...	—
NMNO	New Orleans Lt. V.	2889G
NNBA	Ambrose Lt. V. ...	2920
NNBB	Barnegat Lt. V. ...	2918E
NNBC	Boston Lt. V. ...	2934
NNBE	Delaware Lt. V. ...	2912K
NNBL	Five Fathom Lt. V.	2917E
NNBN	Nantucket Shoals Lt. V.	2928H
NNBS	Pollock Rip Lt. V.	2931E
NNBT	Portland Lt. V. ...	2935
NNCB	Blunts Reef Lt. V.	2757
NNCL	Umatilla Lt. V. ...	2748F
NNCR	Columbia Lt. V. ...	2753
NNCS	San FranciscoLt. V.	2759S
OAT52	Callao	7791F
ODA3	Sidon	2329D

Call Sign	Station	Station No. or Page
OHC OHG	Helsinki	2148A
OUB	Skagens Rev Lt. V.	2104D
OUC	Kattegat S.W. Lt. V.	2111B
OUE	Kattegat S. Lt. V.	2113
OUR	Anholt N. Lt. V. ...	2107B
OUT	Læsø N. Lt. V. ...	2105E
OUU	Gedser Rev Lt. V.	2117
OUV	Aalborg Bugt Lt. V.	2107
OUX	ER Lt. V. ...	2102
OUY	Vyl Lt. V.... ...	2101
OXB	Blaavand	1100D p. 133
OXF	Julianehaab ...	p. 133
OXI	Godthaab	p. 133
OXJ	Thorshavn ...	p. 133
OXM	Kap Tobin ...	p. 133
OXP	Skagen	1104 p. 133
OXQ	Danmarkshavn ...	p. 503
OYE	Rønne	1118C
OYG	Mestersvig ...	p. 503
OYH	Sukkertoppen ...	p. 503
OYJ	Ūmánaq	p. 503
OYL	Tingmiarmiut ...	p. 503
OYN	Upernavik ...	p. 503
OYO	Ivigtut	p. 503
OYP	Qutdligsat ...	p. 503
OYQ	Jakobshavn ...	p. 503
OYR	Egedesminde ...	p. 503
OYS	Holsteinsborg ...	p. 503
OYU	Færingehavn ...	p. 503
OYY	Danneborg ...	p. 503
OZA	Frederikshaab ...	p. 503
OZC	Christianhaab ...	p. 503
OZE	Aputiteq	p. 503
OZL	Angmagssalik ...	p. 503
OZM	Godhavn	p. 503
OZN	Prins Christians Sund	p. 503
OZV	Narssaq	p. 503
OZZ	Dundas	p. 503
PCH	Scheveningen ...	7080B
PKT	Belawan	2569G
RXIF	Mys Borkhaya ...	2532
RYPA	Mys Sopochnaya Karga	2537N
SAG	Göteborg	1178B
SDJ	Stockholm ...	1165
SUH	Alexandria ...	1335A
TFA	Reykjavík... ...	1983G 1985 p. 508
TFV	Vestmannaeyjar ...	1983 p. 508

Call Sign	Station	Station No. or Page
TFX	Siglufjördhur ...	p. 508
TFY	Seydisfjördhur ...	p. 508
TFZ	Ísafjördhur ...	1986B p. 508
TIM	Limón	2780D
TUA	Abidjan	p. 255
TXU	St. Pierre and Miquelon Is. ...	p. 494
TYA	Cotonou	p. 255
UHY	Tiksi ...	2532D
UIX	Mys Chelyuskina ...	2535
UOK	Ostrov Chetyrekh-stolbovoy ...	2530C
UOX	Mys Otto Shmidta	2529
UPB	Bukhta Provideniya	2525D
UPM	Amderma	2543F
UPR	Mys Uelen ...	2527
UPV	Dikson	2537F
URA	Mys Zhelaniya ...	2545C
USY	Nordvik	2533
VAE	Tofino	p. 399
VAF	Alert Bay	p. 399
VAG	Bull Harbour ...	p. 399
VAI	Vancouver ...	p. 399
VAJ	Prince Rupert ...	p. 399
VAK	Victoria	p. 399
VAL	Inoucdjouac ...	p. 499
VAP	Churchill	p. 499
VAR	St. John, N.B. ...	p. 494
VAS	First Narrows Bridge	7738E
VAT	Partridge I. ...	2950A
VAU	Yarmouth, N.S. ...	p. 499
VAV	Poste-de-la-Baleine	p. 499
VAW	Resolution I. ...	2962D p. 499
VAY	C. Hopes Advance	2962 p. 499
VBK	Three Rivers ...	p. 494
VBZ	Chesterfield Inlet ...	p. 499
VCB	Nottingham I. ...	2963 p. 499
VCC	Québec	2953Z p. 494
VCD	Rivière-du-Loup ...	2953P p. 494
VCF	Mont Joli	p. 494
VCG	Fox River	p. 494
VCK	Sept Iles	p. 494
VCM	Belle Isle	p. 494
VCN	Grindstone I. ...	p. 494
VCO	Sydney	p. 494
VCP	St. Lawrence ...	p. 494
VCS	Halifax	2951F p. 494 7951F
VFF	Frobisher	p. 499
VFN	Montréal	p. 494
VFZ	Goose Bay ...	p. 494
VGA	Lurcher Lt. V. ...	2950L
VOJ	Corner Brook ...	p. 494
VOK	Cartwright ...	p. 494
VON	St. John's (Nfld.) ...	p. 494
VOO	Comfort Cove	p. 494
VPO	Barbados	p. 427
VRP	Suva	p. 384
VRS	Mauritius	p. 266
VRT	Bermuda	1875 p. 431
VSB	Nuku'alofa ...	p. 384
VSH	Bathurst	p. 253
VSI	Turks Island ...	p. 431
VWC	Calcutta	1421C
VWN	Cochin	p. 273
VWST	Calcutta (Sand-heads) Pilot Vessels	p. 273
XBRR1	Estero de Punta Banda	2770F
XBRR2	Islas de Todos Santos	2770G
XPF	Nipisat	p. 503
XYCZ	Rangoon Pilot Vessel	1425B
ZCQ	Seychelles	p. 266
ZDK	Gibraltar	p. 211
ZLAZ	Westport	7605T
ZLB	Awarua	p. 380
ZLD	Auckland	p. 380
ZLEA	Mount Victoria ...	7612F
ZLES	Taiaroa Head ...	7608E
ZLSD	Timaru	7609
ZLW	Wellington ...	p. 380
3XC	Conakry	p. 253
4PB	Colombo	p. 276
4YA	Alfa (O.W.S.) ...	2992A
4YB	Bravo (O.W.S.) ...	2992B
4YC	Charlie (O.W.S.) ...	2992C
4YD	Delta (O.W.S.) ...	1992D 2992D
4YE	Echo (O.W.S.) ...	1992E 2992E
4YI	India (O.W.S.) ...	1992I 2992I
4YJ	Juliett (O.W.S.) ...	1992J 2992J
4YK	Kilo (O.W.S.) ...	1992K 2992K
4YM	Mike (O.W.S.) ...	1992M 2992M
4YN	November (O.W.S.)	1629N 2629N
4YP	Papa (O.W.S.) ...	1629P 2629P 7629P

Call Sign	Station	Station No. or Page	Call Sign	Station	Station No. or Page
4YV	Victor (O.W.S.) ...	1629v 2629v	70A	Aden	p. 269
5BA	Cyprus	p. 243	8RB	Demerara	2843 p. 426
5OW	Lagos	p. 256			
5ZF	Mombasa	2403A p. 267	9HD	Malta	p. 230
6VA	Dakar	p. 253	9LL	Freetown	p. 254
6YI	Kingston	p. 429	9PA	Banana	2380

it impossible to plot the station satisfactorily; it is *not* used in cases where only the *graticule* of the largest scale chart is incorrect according to later determinations. It is not used in respect of those Aero Radiobeacons whose positions are given to the nearest minute of latitude and longitude only, *unless* it is thought that there may be an error of more than half a minute.

With the exception of the Aero Radiobeacons mentioned above, for which exact positions are not available, and of Ocean Weather Ship stations, all geographical positions are given to the nearest second of arc.

See also information given under the heading Site.

Power

In cases where the controlling authorities do not state the Range of a beacon, and in a few other cases, the output power is given, in kilowatts, where known. Owing to variations in propagation conditions, etc., there is no fixed relationship between transmitter power and range. The following table is merely a tentative guide to the range at which an average beacon of a given power *may be expected* to be usable for D/F purposes under good conditions. (Naturally, the ranges quoted bear no relation to those at which reception is possible for *communication* purposes).

Output Power (kW)	Range (nautical miles)	Output Power (kW)	Range (nautical miles)
0·025	45	1·0	240
0·05	80	1·5	280
0·1	100	2·0	300
0·2	130	3·0	330
0·3	155	5·0	400
0·4	170	10·0	500
0·5	180		

It will be appreciated that the ranges obtained in practice will depend on a number of factors. These include: the rate of attenuation over the transmission path; the efficiency of the transmitter, i.e. the extent to which its power is radiated as vertically-polarized waves; the efficiency of the ship's D/F apparatus, the location of the D/F aerial, and the type of presentation employed (aural null, output meter, automatic D/F with pointer or cathode ray tube bearing indication); the extent to which interference from skywave components is present on any particular occasion; the amount of interference from other beacons operating on the same or nearby frequencies; and the level of background noise.

See also information given under the heading Range.

" QTG " Service

A form of radiobeacon service provided, on request, by a Coast Radio Station. For further information see section headed " QTG " Service.

Racon

A radar transponder beacon. Cross-references to radar beacons are retained in the Radiobeacon section of this volume for the time being. For definitions and service details, see the separate Section entitled Radar Beacons.

Radar Station

Cross-references to coast radar stations are retained in the Radiobeacon section of this volume for the time being. For a definition, and service details, see the separate Section entitled Coast Radar Stations providing Navigational Assistance to Ships.

Radiobeacon

In its most general sense, the term Radiobeacon (for which the abbreviated form Beacon may be substituted in circumstances in which no ambiguity could arise) indicates a transmitting station designed to enable a mobile station to determine its bearing (and/or, in certain cases, its range) from the transmitter by the use of the mobile station's own D/F apparatus and/or communications receiver, but without the necessity for establishing communication with the transmitting station (except, in certain cases, for the transmission of a request for beacon service).

Certain special types of radiobeacon are indicated by the terms Consol Beacon, Directional Radiobeacon, Rotating Pattern Radiobeacon, and Transponder Radiobeacon: see the information given under these headings, and also under the heading Super High Frequency (S.H.F.) Radiobeacon. When used without qualification, as a

4. A number of Aero Radiobeacons considered to be particularly unsuitable for marine use have been omitted from this edition and others may be removed by Section VI of the Weekly Edition of Notices to Mariners. Associated chart action will be effected as opportunity occurs. Meanwhile, mariners are warned that the charted position of an Aero Radiobeacon not listed in this volume may be in error. 48/69

WARNING

It is very important that the following facts be understood when using Aero Radiobeacons:

1. The inclusion of an Aero Radiobeacon in this volume does NOT imply that it has been found reliable for marine use.
2. It is not possible to predict the extent to which "land effect" (see page 66) may render bearings unreliable.
3. Although every effort is made to publish changes as they occur, information concerning alteration, shifting or withdrawal of Aero Radiobeacons, may fail to reach the Hydrographic Department in time for a notice to be promulgated before the alteration etc takes effect. (Supp.)

used, and any automatic volume control device should be switched off; the considerations here are similar to those described in the section headed Directional Radiobeacons.

Certain Rotating Pattern Radiobeacons in Japan operate in the S.H.F. (super high frequency) band. All the available details of the operation of these are given in the list of service details; for general remarks see under the heading Super High Frequency Radiobeacons, in section headed Definitions and General Information.

AERO RADIOBEACONS

General

In principle, radiobeacons operating in the low and medium frequency bands may be used by both ships and aircraft. In coastal regions, some administrations have established radiobeacons specifically for both marine and air navigation: these beacons are classified as " aero-marine ". However, it is generally found that the differing requirements of marine and air navigation necessitate the establishment of separate radiobeacon systems.

Marine radiobeacons are generally sited in such a way as to obtain an uninterrupted transmission path over as wide a sea area as possible, and they generally operate in such a way as to facilitate the taking of cross-bearings. Air navigation techniques, on the other hand, generally require radiobeacons to be sited in such a way that aircraft may fly direct from beacon to beacon, and it is also necessary that radiobeacons for aircraft use should operate continuously in all weathers during their hours of service, so that the " radio compass " (automatic D/F) aboard the aircraft may give continuous readings.

Advantages of Aero Radiobeacons for Marine Use

In selecting L/F and M/F aero radiobeacons in coastal regions for inclusion in this volume, certain favourable factors have been taken into account.

In many parts of the world, marine radiobeacons are relatively few and far between, and may even be unreliable for one reason or another. In some regions, in fact, marine radio navigation is only possible by means of aero radiobeacons; these are generally provided with standby equipment as a precaution against breakdown.

Even in regions where there is adequate provision of marine radio navigational aids, the availability of aero radiobeacons may be of value when marine radiobeacons are temporarily out of service, or when there is heavy interference in the marine beacon band.

By international agreement, the power of radiobeacons is limited so as to minimise interference. In some regions it may be found necessary, and permissible, for aero radiobeacons to radiate much stronger signals than do the marine radiobeacons in the same area; this applies particularly to aero radiobeacons used by aircraft making a landfall after an ocean crossing. Thus, in some regions, these powerful aero radiobeacons provide a useful landfall aid for shipping also, since daytime bearings on them may be obtained before the ship comes within range of any coastal marine radiobeacons. (By night, skywave interference may be expected to nullify this advantage).

Since most aero radiobeacons transmit continuously, it is possible to take bearings on them at any time during their hours of service, in fog or clear weather. This may be found advantageous, particularly in cases where an aero radiobeacon is situated at or near the ship's destination or next landfall, so that a " homing " procedure may be adopted. In these circumstances, for a ship navigating in the open sea, errors due to " land effect " may be of little consequence, since the only effect of a slightly erroneous heading would be a slight increase in the distance run, not a wrong landfall, since in a " homing " procedure the heading is " self-correcting " as the beacon is approached. Moreover, with continuously-operating beacons, the accuracy of bearings obtained in clear weather may be checked by comparison with visual fixes, thus affording a good idea of the degree of reliance which may be placed on these radio bearings in thick weather; this is not always conveniently possible with those marine radiobeacons whose clear weather transmissions are limited.

In view of the above considerations, L/F and M/F aero radiobeacons in coastal regions are generally included in this volume. However, certain reservations must be made, as indicated in the following paragraphs.

Omission of Certain Aero Radiobeacons

Aero radiobeacons are omitted from this volume if they are situated so far from open water that their stated power or range does not appear to permit a useful marine coverage.

In regions where radiobeacons are numerous, the less powerful aero radiobeacons,

and those with restricted hours of service, may be omitted. However, in certain circumstances, two or more aero radiobeacons operating in the same locality may be included in the list: this provides an alternative in case one of them should be out of service, or be found to give unreliable bearings for one reason or another, and it also avoids the possibility of mistaken identity due to the fact that the signals of such beacons may be similar or even identical. Where two or more aero radiobeacons in the same locality are listed, the Admiralty charts will normally show the most powerful one, the others being charted only if their positions are accurately known and are sufficiently different.

Limitations of Aero Radiobeacons

It must be clearly understood that the inclusion of an aero radiobeacon in this volume does *not* imply that it has been found reliable for marine use. Aero radiobeacons are not generally calibrated for use at sea level, and the information available concerning unreliability of bearings refers only to the altitudes at which aircraft normally fly. It is not possible to predict the extent to which " land effect " may render bearings unreliable. Such information as is available suggests that " land effect " is more likely to make itself felt in areas relatively close inshore; it is presumed that refracted and reflected waves, having less energy, tend to be eliminated by attenuation over a certain distance, so that bearings taken at a greater distance from the coast may be comparatively free from errors arising from this cause. Be that as it may, it remains the responsibility of the user to ensure that all due precautions are taken when radio bearings are obtained, and that the possibility of errors is borne in mind when such bearings are laid off on the charts.

Apart from the unpredictable incidence of " land effect ", certain other points must be borne in mind when using aero radiobeacons; these points concern the possibility of inaccuracies in the particulars given in the list of service details, and the possibility of the unforeseen alteration, shifting, or withdrawal of aero radiobeacons.

The positions of aero radiobeacons as given by the controlling authorities are not always compatible with the geodetic datum of the Admiralty charts. While every care is taken to ensure that the positions quoted in this volume are correct with reference to the largest scale graduated Admiralty chart, the information available does not always permit the necessary adjustments to be made with certainty. Quite commonly, positions are given by the controlling authorities to the nearest minute of latitude and longitude only; where such positions are quoted in this volume without adjustment, no " seconds " figures are given. Positions which, although quoted to the nearest second, are nevertheless regarded as approximate, are indicated by the abbreviation (*P.A.*). Changes of position of more than one mile are promulgated on receipt, unless the largest scale chart of the area concerned is on a very small scale; minor changes of position may not be promulgated immediately, in order to avoid excessive manuscript corrections of no practical value.

It was formerly considered that, bearing in mind the necessity of avoiding excessive corrections, details of hours of service of aero radiobeacons could not generally be given in this volume; likewise, details of types of emission, and of power or range (which were not always available), were also omitted. In order to increase the usefulness of the list, these details have now been added, where known; it must be borne in mind, however, that in many cases the information is obtained indirectly, and may to that extent be unreliable.

Since various radio navigational aids, other than L/F and M/F radiobeacons, are now available for use by aircraft, aero radiobeacons may sometimes be discontinued on grounds of redundancy; it is not always possible to give advance warning of this. Moreover, although every effort is made to keep abreast of changes as they occur, there is always the possibility that notice of a change in the position or service details of an aero radiobeacon may fail to reach the Hydrographic Office; in some cases conflicting information is received from different sources.

Hours of Service

Apart from short breaks for maintenance purposes, *aero radiobeacons listed in this volume operate continuously throughout the 24 hours unless otherwise stated.* No attempt has been made to indicate the *exact* hours of service of beacons which do *not* operate continuously. Beacons which are stated to operate " by day " may shut down at week-ends when the aerodromes at which they are situated are closed, and their switch-on and switch-off times may vary; they may be heard to operate outside their normal hours, for the use of aircraft on particular flights. Beacons whose service is stated to be " occasional " generally operate *only* as required by aircraft on particular flights; their usefulness to shipping is obviously limited, but they are included in the list in areas where few continuously-operating beacons exist.

Call Stations

In respect of aero radiobeacons located on isolated islands, and certain others, a

Call Station is specified in cases where a Coast Radio Station (or an Aeradio Station which may accept calls from ships) is located at or near the radiobeacon, if the latter normally provides occasional service only. This does not imply that a specific arrangement exists for the operation of the radiobeacon for the use of ships, although in some cases it is known that such an arrangement does exist. Whenever a request for the operation of an aero radiobeacon is made, as much notice as possible should be given, in order to allow time for any necessary arrangements to be made; the frequency and identification signal of the beacon requested should be specified. Even so, it must be borne in mind that it may not be possible to operate the beacon at the time required; however, the call station may be able to supply details of the times of the next beacon transmissions which will be made for the benefit of aircraft on scheduled flights. If beacon service is provided in response to a request, a charge may be made, but information regarding such charges is not generally available.

Method of Listing Aero Radiobeacons

In order to facilitate quick reference, aero radiobeacons included in this volume are listed in the alphabetical order of their names, following the marine radiobeacons and " QTG " stations (if any), under each geographical heading. However, the larger Aero Radiobeacon sections have been sub-divided geographically, where appropriate, in order to make it easier to select beacons for use in any particular area, bearing in mind that, although aero radiobeacons are shown (in blue) on the Radiobeacon Diagrams, many have had to be omitted from the diagrams on account of limitations of scale. Beacons so omitted are indicated in the lists by an asterisk (*) placed to the left of the name. (This does not apply to beacons in regions not covered by Diagram: no asterisk is used in these cases). The morse Identification Signal of each beacon is given in the left-hand column of the list, in bold type.

Where two names are given in respect of an aero radiobeacon, the first is generally the name of the locality, while the second, in parentheses, is generally the name of an aerodrome with which the beacon is associated. The aerodrome name is included partly for administrative convenience, since this is generally the name used in the air publications in referring to the beacon; the aerodrome name may not appear on Admiralty charts. When corrections to the list are issued, the Identification Signal, as well as the names, will be quoted, to ensure positive identification.

The identification signals of aero radiobeacons will not be found in the List of Radiobeacon Identification Signals in this volume. In view of the method of presentation employed, it should not be difficult to identify any aero radiobeacon whose identification signal is picked up, if it appears in the list of service details, although in some areas it may be necessary to look under several geographical headings in order to identify a beacon. Under conditions of skywave reception, of course, ships' receivers may pick up the signals of many inland radiobeacons which are *not* listed in this volume.

In view of the fact that the insertion of aero radiobeacons on Admiralty charts did not commence until March 1965, their names are not yet included in the alphabetical index of this volume, which is designed to facilitate the location of the service details of any station shown on the charts. To locate the service details of a beacon which is known to be in a particular country, use should be made of the Index of Geographical Sections, which will give a page reference to the beginning of the appropriate section.

Directional Aero Radiobeacons

Aero radiobeacons listed in this volume are non-directional beacons unless otherwise stated. A directional aero radiobeacon is known as a Radio Range (abbreviation: R.R.). For general remarks concerning directional beacons, see section headed Directional Radiobeacons. An aero Radio Range has four " Range Legs ", each of which is a narrow sector in which a continuous note is heard; the bearings of these Range Legs, as listed in this volume, are *true* (the bearings given by the controlling authorities are *magnetic*), and the bearings are given *towards* the station. Between the Range Legs, instead of the continuous note, the complementary signals A and N are heard in alternate sectors; the sectors containing the magnetic meridian are usually " N " sectors. The transmissions which form the sector signals and Range Legs are interrupted at intervals by the station's identification signal (which may itself be directional, being transmitted twice—once by each half of the directional system—in order to ensure that it is audible in all sectors, and to give a secondary sector indication).

The following example illustrates the method of presentation:

Range Legs 045 A 130 N 225 A 310 N.

In this example, a continuous note will be heard when the beacon bears 045° (plus or minus 1 or 2 degrees) from the ship; thence, A is heard in the sector between the

ALPHABETICAL LIST OF MORSE IDENTIFICATION SIGNALS OF MARINE AND AERO-MARINE RADIOBEACONS

Notes.—(1) See information given under the heading Identification Signal, in section headed Definitions and General Information.
(2) Reported or uncertain items are shown in *italics*.

Signal	Radiobeacon	Station No.	Signal	Radiobeacon	Station No.
A	Amphitrite Pt. ...	2739D	B	Almirante	2781C
	Cape Bonavista ...	2958Z		Beaver Island ...	2951N
	Caribou I.	2943M		Cape Bauld ...	2955X
	Cary's Swan Nest ...	2963A		Cape Wickham ...	2902
	Gros Cap Reef ...	2943F		Fowey Rocks ...	2905W
	Lurcher Lt. V. ...	2950L		Great Duck I. ...	2942D
AA	Tampico	2881C		Goodwin Island ...	2961S
AAAA	Kao-hsiung... ...	2437A		Kains Island ...	2735C
AB	Abidjan	2370Y		Mount Desert Rock	2936D
	Mys Abramovskiy...	2549B		Red Islet	2953M
	Akraberg	2095B		Slate Islands ...	2943T
	P8 Lt. V.	2086M		South Buffalo ...	2940Q
AD	Ameland	2083	BA	Ile de Batz ...	2218
	Ostrov Askol'd ...	2497	BB	Bjurõklubb... ...	2158C
ADL	Adèle I.	2586T		Recalada á Bahia Blanca	2814
AF	Mys Afrika	2521F			
AG	Cap de l'Aiguille ...	2349	BC	Cap Blanc	2344D
AH	Akhtarskiy ...	2315M	BD	Barra Head ...	2029
AI	Ostrov Krestovskiy	2537K	BDA	Gibbs Hill	2875G
AJ	Ajos...	2154	BE	Borkum	2085Q
AK	Anholt North Lt. V.	2107B	BF	Borkumriff Lt. V. ...	2085L
	Oukacha	2354T	BI	Timezrit	2346N
AL	Alert Bay	2735E	BJ	Bjørnsund	2196P
	Alevina	2514		Cabo Bojador ...	2359B
	Algiers	2347H	BK	Baltiysk	2133
	Almagrundet ...	2165B		Breaksea Lt. V. ...	2013
	Pointe d'Ailly ...	2214	BL	Butt of Lewis ...	2030
AM	Esan Misaki ...	2463F		Mys Balyuzeka ...	2499D
AN	Akhilleonskiy ...	2316C		Salinópolis	2835H
AO	Aonai Misaki ...	2461K	BM	Brämön	2161D
	Caió...	2367D	BN	Les Baleines ...	2222K
AR	Arendal	2185		Baniyas	2328
	Ashizuri Saki ...	2477C		Cap Bon	2343
$\overline{AR}$	Tybee	2902A		Mys Belkina ...	2501
AS	Aarhus	2109		Svenska Björn Lt. Ho.	2163S
	Abashiri	2492J			
	Angissoq	2971T	BNA	Banana	2380
	Poronaysk	2508U	BO	Boulogne Lt. Ho. ...	2213A
AST	Astrid	2178F		Mikoyanovsk ...	2517
AT	Augusta	2282H		Port de Bouc ...	2263D
	Mys Aitodor ...	2310	BØ	Bøkfjord	2208H
AU	ER Lt. V.	2102	BR	Bar Lt. V., Liverpool	2019
AV	Abrolhos	2832E		Cap Béar	2262E
	Aveiro	2238G		Ostrov Bol'shoy Shantar	2509F
AW	Mys Aniva	2501F			
AWAE	Axios	2300D		The Brothers ...	2604H
AY	Abertay Lt. V. ...	2039		Ostrov Bol Zhuzh-muy	2552
AXA	Troughton Islet ...	2586P			
AXB	Cape Leeuwin ...	2588J	BS	Belosarayskiy ...	2313G
AXC	Cape Borda ...	2589P		Port en Bessin ...	2217
AZ	Ôma Saki	2464D	BT	Batumi	2323A
A3	Portland Head Cal. Stn.	2935A		Belle Ile	2221A
				Bjargtangar ...	2985T
				Chin-shan	2449L

Signal	Radiobeacon	Station No.
BT	Mys Taran	2134
	Punta Soldada ...	2787C
	Vasskären	2179C
BU	Bubolmråsa ...	2198B
BÜ	Mys Bryusa ...	2945N
BW	Ostrov Baydukova	2507E
BWS	Browse I.	2586R
BX	BXA Light-float ...	2222[illegible]
	Blanc Sablon ...	2955N
BY	Bressay	2032C
	Collingwood	2914R
C	Cape Lookout ...	2904G
	Cape St. Francis ...	2958X
	Cape St. James ...	2734C
	Charles Island ...	2962J
	Cleveland Ledge ...	2929G
	Cleveland Harbour	2940D
	Cross I.	2950Z
	Keweenaw	2945D
	Mobile Pt.	2892B
	Muskegon	2949F
	Point Loma ...	2768E
	Port Cartier Harbour	2954M
	Saint Martin I. ...	2947P
	Tela...	2776D
CA	Pointe de Créac'h ...	2218E
CB	Belum	2088M
	Cape Blanco ...	2811
	Corbière	2065
	Mys Chaplina ...	2525P
	Terpeniya Consol ...	2508T
CC	Cape Campbell ...	2609E
CD	Cheju	2455B
CE	Ceuta	2352
CF	Capo Ferro... ...	2272W
	Ostrov Vil'kitskogo	2538F
CG	Changgi Gap ...	2456A
	Tierre Bomba, Ile...	2848
CH	Cruncher I.... ...	2967V
CI	Porto Civitanova ...	2288V
CJ	Hachijô Shima ...	2480H
CK	Chikyû Misaki ...	2487G
	Chuk Do	2454C
	Mys Voronkovskiy	2558D
CL	Calais	2212A
	Capo Colonne ...	2282V
CLN	Hiran Pt.	2421P
CM	Channel Head ...	2956R
	Chumunjin Tan ...	2456B
	Cromer	2051
	Dikson	2537F
	Shakotan Misaki ...	2461D
CN	Cregneish	2021
CO	Capo Carbonara ...	2272C
CONA	Punta Corona ...	2799E
CP	Mys Leskin... ...	2538
	Pointe de Chiappa	2269
	Saint Catherine's Pt.	2006D
CR	Cap Couronne ...	2263E
	Capo Caccia ...	2273K
	Constanța	2302E
	North Carr Lt. V....	2039D
CS	Chesterfield Inlet ...	2963K
CT	Iro Saki	2480E
	Punta San Cataldo di Lecce	2285
CV	Cabo Carvoeiro ...	2240
CW	Cape Wrath ...	2030H
CX	Cap Caxine ...	2348C
CY	Yong Do	2455Y
C2	Coney I. Cal. Stn. ...	2923D
C3	Brandywine Shoal Cal. Stn.	2916
ChN	Shoyna	2548C
ChO	Mys Marrye Salya...	2542O
ChP	Mys Shipunskiy ...	2520
D	Bird Rocks ...	2952H
	Cabot I.	2959
	Cape Acadia	2963B
	Carmanah Point ...	2739K
	Cove I.	2941N
	Five Finger Islands	2707
	Point Judith ...	2927G
DA	Belyy Yugorskiy ...	2543L
	Dalatangi	2988D
	Pladda	2026
DB	Doobskiy	2317F
DD	Grundkallen ...	2163C
	Ta-chi Shan ...	2445C
DG	Daugavgriva ...	2137D
	Douglas	2022
	Drogden	2115C
DH	Hua-niao Shan ...	2445
DHE	Helgoland	2086Z
DK	Dyck Lt. V. ...	2211G
DN	Dolphin's Nose ...	2420Z
DO	Nyûdô Saki ...	2467D
DR	Daugavgriva Lt. Buoy	2137
DT	Daunt Lt. V. ...	2070
DU	Dungeness	2059
DY	Cap Bengut ...	2347B
	Dyna	2181D
	Eddystone	2008E
E	Charleston	2902S
	N. Manitou Shoal ...	2949V
EA	Mys Yevpatoriyskiy	2308D
EC	Och'ong Do ...	2452G
EH	Ponta do Céu ...	2836
EI	Nos Emine ...	2301E
EK	Eskimo Point ...	2963I
EL	Elbe No. 1 Lt. V. ...	2088
EN	Yenikal'skiy ...	2312C
ENES	Estero de Punta Banda	2770F
EO	Mys Yegorova ...	2500E
EP	Estevan Pt. ...	2736E
ER	Eierland	2081M
ES	Cape Scott	2735B
EZ	Mys Yelizavety ...	2508E
É	Partridge I. ...	2950A
ÉR	Pointe de Ver ...	2216D
F	Angus I.	2943Z
	Baccalieu I. ...	2958Y
	Block Island ...	2927D
	Farallon	2759F

Signal	Radiobeacon	Station No.
F	Fjøløy	2189
	Georgetown ...	2903E
	Hope I.	2941Y
	Low Point	2952B
	Sabine Pass ...	2885
FÅ	Fårö...	2167T
FB	Flamborough Head	2046
	Rio Grande ...	2825D
FE	Fehmarnbelt Lt. V.	2121
	Mys Sopochnaya Karga	2537N
FF	Falsterborev Lt. V.	2176
	Freetown	2369D
FG	Fuglehuken ...	2978E
	Pointe de Barfleur	2217D
FH	Frederikshaab ...	2970
	Fruholmen	2206
FI	Cabo Finisterre ...	2234
	Finngrundet Lt. V.	2162
FK	Frederikshavn ...	2105B
	Matsumae	2462
FL	Fladen Lt. V. ...	2177M
FN	Feistein	2188
FO	Byely Nos	2543I
FØ	Fanø	2100
FR	Færder	2183F
	Finike	2326F
FRQ	Plonéis Consol ...	2220K
FS	Kalkgrund	2120B
FSS	French Frigate Shoals	2627
FT	Cap Ferret	2224D
FU	Fulehuk	2182E
FUB	Stralsund Cal. Stn.	2122A
FV	Ostrov Belyy ...	2542
F2	Cape Henry Cal. Stn.	2906D
F3	Thomas Point Shoal Cal. Stn.	2911C
G	Ashtabula Harbour	2940K
	Cranberry Island ...	2951S
	Diamond Shoal ...	2905E
	Gdynia Cal. Stn. ...	2128D
	Grødheimhamaren...	2188F
	Gull I.	2959J
	Heath Point ...	2955E
	Kewaunee	2947X
	Middle Island ...	2961B
	Nobska Point ...	2930
	Point Arena ...	2575D
	Sand Heads ...	2738M
	Smith Island ...	2743
GA	Grinna	2198D
	Málaga	2251M
	Outer Gabbard Lt. V.	2052D
GB	Bremerhaven Cal. Stn.	2087R
GD	Cap de Garde ...	2345G
	Girdle Ness... ...	2037
	Goderich	2941J
	Gustav Dalen ...	2166
	Mys Bol'shoy Gorodetskiy ...	2556
GE	Skarvøy	2188A
GENE	Punta Dungeness ...	2802C
GG	Eggegrund	2162D
GH	Grenaa	2108
GK	Kattegat S. Lt. V....	2113
GL	Eagle I.	2073
	Ile de la Giraglia ...	2267
GM	Mys Gamova ...	2495E
GN	Cap Gris Nez ...	2212D
	Godhavn	2966C
	Gustavsvärn ...	2149B
GO	La Garoupe ...	2266D
GR	Gedser Rev Lt. V.	2117
	Goeree Lt. V. ...	2078C
	Grímsey	2987G
GS	Gotska Sandön ...	2167
GU	Cap Bengut ...	2347B
	Geitungane... ...	2189G
	Tongue Lt. V. ...	2054
GV	Genova	2275G
GW	East Goodwin Lt. V.	2057
GX	Ile de Groix ...	2220W
GY	Grasøyane	2195E
H	Devil's Head ...	2956M
	Egmont Cay ...	2895D
	Langara Point ...	2733F
	Seal Island	2950S
	Southeast Shoal ...	2939N
HA	Cape Hopes Advance	2962
	Halten	2198
	Harmaja	2147
	Hekura Shima ...	2468D
	Pointe d'el Hank ...	2355C
HB	Hals Barre	2106C
	Hollerwettern Cal. Stn.	2089
HC	Kish Bank Cal. Stn.	2067
HD	Hällgrund	2161H
	Hendanes	2194H
HE	Hestehoved ...	2116N
	Helsinki Cal. Stn. ...	2148A
HG	Holmögadd... ...	2160
	Holmengrå	2193
HH	Hook of Holland ...	2078E
HI	Helsinki	2146H
HK	Hekkingen	2204P
	Kholmsk	2502F
	Texel Lt. V. ...	2081E
HL	Hel	2128C
HM	Hanstholm	2103
HN	Hino Misaki ...	2478N
HO	Hiroo	2489R
	Hirsholm	2105
	Hook of Holland Cal. Stn.	2078F
	Hornbjarg	2986G
HR	Khodovarikha ...	2547B
HS	Helnes	2207
HT	Hamada	2469B
HYO	Papeete	2617G
IA	Llanes	2230
IB	Ilha Berlenga ...	2239D
IH	Ilha Rasa	2829
IK	Isokari	2151E
IL	Il'inskiy	2310J

Signal	Radiobeacon	Station No.
IN	Bon Portage I. ...	2950T
IMI	Cape Henlopen ...	2913F
IP	Capo Sandalo ...	2273T
IR	Hirtshals Havn ...	2103C
IS	Isla de Sacrificios ...	2879D
IY	Inubô Saki	2485E
J	Ashe Inlet	2962G
	Country Island ...	2951Q
	Eagle Harbour ...	2945H
	Gereaux I.	2941Z
	Guard Islands ...	2727G
	Jupiter Inlet ...	2899
	Little Gull I. ...	2925G
	Perroquet Islands ...	2954T
	Race Rocks ...	2740E
JM	Mys Zhelaniya ...	2545C
	Tsuno Shima ...	2469G
JS	Lesovskiy	2225C
J3	Mobile Pt. Cal. Stn.	2892B
J4	South Pass Cal. Stn.	2889
J5	Galveston Cal. Stn.	2883B
J7	Aransas Pass Cal. Stn.	2882D
K	Bicquette I. ...	2953J
	Cape Henry ...	2906D
	Ediz Hook	2747
	Execution Rocks ...	2926E
	Green Bay Harbour	2946Z
	Huron I.	2945P
	Kamen' Opasnosti	2501T
	Killarney	2942A
	Klepp	2190
	Lennard I.	2736L
	Patos Island ...	2742E
	Portland Lt. V. ...	2935
	St. Paul I.	2649
	Swaffield Harbour ...	2962S
	Thunder Bay I. ...	2942Q
KA	Kaybolovo	2141
	Kinkasan Tô ...	2486G
	Klaipeda	2134C
	Mys Kyz-Aul ...	2311D
KB	Kiel Cal. Stn. ...	2120D
	Kołobrzeg	2126
KC	Kashkarantsy ...	2554E
KD	Kalbådagrund ...	2146D
	Kinnairds Head ...	2036
	Mys Kodosh ...	2318D
	Same Kaku ...	2487E
KF	Kefken Adası ...	2325N
KH	Kish Bank	2067
	København... ...	2115
KI	Kiel...	2120C
KK	Kusakaki Shima ...	2469T
KL	Nan-san-shan Tao...	2451D
	Klövningarna ...	2180G
	Kolkasrags	2136D
	Nos Kaliakra ...	2301J
	Ras Serani	2403A
	Sklinna	2198S
	Yüan Tao	*2451F*
KM	Kömun Do... ...	2455G
	Krynica Morska ...	2129L
	Mys Sosunova ...	2502S

Signal	Radiobeacon	Station No.
KN	Kallan	2153E
	Kanin Consol ...	2547Z
	Skråven	2202
KO	Mys Kronotskiy ...	2520D
KP	Kylmapihlaja ...	2152
	Mys Krasnyy Partizan	2505
	Sunderland ...	2045D
KR	El Attaïa	2342
	Kyubassare ...	2137K
	Mull of Kintyre ...	2027
KS	Mys Kanin Nos ...	2548
	Stora Karlsö ...	2168D
	Terpeniya Consol ...	2508T
KT	Katsuura	2484K
	Kungsgrundet ...	2166M
KU	Kokøerne	2969C
	Krogstadsudde ...	2177F
KUL	Kullen High ...	2176L
KV	Nordvalen	2160A
KW	Korsakovskiy ...	2501K
KX	Mys Kril'on ...	2502
KY	Hanasaki	2492C
	Oksøy	2187A
K1	Whitefish Pt. Cal. Stn.	2945Y
K2	Cleveland Cal. Stn.	2940D
L	Bonilla Island ...	2734D
	Buzzards Bay ...	2929
	Cape Schanck ...	2593C
	Eldred Rock ...	2694
	Falkner Island ...	2926P
	Isla de Lobos ...	2820D
	Long Pt., Lake Erie	2939F
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	Miscou Island ...	2952T
	Rawley Point ...	2947Z
	San Juan	2855
	Western Head ...	2950W
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	Ô Shima	2481
LB	Elbe No. 1 Lt. V. Cal. Stn.	2091
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	Mys Likhacheva ...	2525D
LC	Leça...	2238
LD	Mys Datta	2505E
LE	Kapp Linné ...	2980
	Łeba	2127C
LEC	Stavanger Consol ...	2188B
LG	Eilean Glas... ...	2029G
	Landegode	2201C
	Lugo Consol ...	2231L
LH	Le Havre Lt. V. ...	2215
LI	Livorno	2277
LJB	Bjørnøya	2581
LK	Mys Lopatka ...	2518D
	Pointe de la Coubre	2223
	Sule Skerry... ...	2031
LL	Hållö	2180D
LM	Isle of May... ...	2040
	Lamanon	2504D
LN	Langøytangen ...	2184
LO	Landsort	2165E
LP	La Pallice	2222P
	Loop Head... ...	2072N

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LT	Læsø N. Lt. V. ...	2105E
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	Longstone	2042
	Mys Litke	2509
LV	Amderma	2543F
	Dudgeon Lt. V. ...	2050
LY	Yangtze North ...	2446
LZ	Lawn Point ...	2733Z
	Lizard	2009
M	Cape Makkovik ...	2961F
	Detroit River ...	2939Q
	Frying Pan Shoals	2904
	Kilauea Point ...	2626G
	Limón	2780D
	Manitou Island ...	2945L
	Mary I.	2730D
	Milwaukee	2948L
	Richibucto Head ...	2952R
	Rochester Harbour	2938L
	San Francisco Lt. V.	2759S
	Sisters I.	2737D
	South Pass	2889
MA	Bari	2287G
	Cabo Machichaco ...	2228D
	Malarrif	2985E
	Marstein	2192C
	Ostrov Matveyev ...	2546M
MÄ	Mäntyluoto ..	2152D
	Mys Mayachnyy ...	2510E
MB	Humber Lt. V. Cal. Stn.	2047
	Morecambe Bay Lt. V.	2020D
MC	Capo Santa Maria di Leuca	2284G
	Mew I. Cal. Stn. ...	2066
	Ponta Macúti ...	2394D
MD	Cabo Mondego ...	2239
MF	Cap Matifou ...	2347F
	Muckle Flugga ...	2032
MH	Mahón	2260M
	Ostrov Mokhni ...	2140E
MI	Marjaniemi ...	2153T
MIC	Michaelsdorf ...	2121G
MK	Mys Marekan ...	2510
MM	Malõren	2155E
	Me Shima	2470D
MN	Hammerodde ...	2119
	Malindi	2403G
	Maslen Nos	2300Z
	Monbetsu	2492M
	Pointe des Monts ...	2954J
MO	Erimo Misaki ...	2489
	Moskal'vo	2508
MR	Marienleuchte ...	2121C
	Montedor	2237
	Ostrov Monneron ...	2502D
MS	Ostrov Chirachiy ...	2544H
	Sibiryakov	2538D
MT	Kapp Martin ...	2980E
	Muroto Saki ...	2478
MU	Middlegrunds Fort Cal. Stn.	2114E
MU	Ostrov Mud'yugskiy	2550
MV	Montevideo	2820
MW	Mew I.	2066
	Mys Vasil'yev ...	2518
MWN	Bushmills Consol ...	2075M
MY	Cabo Mayor ...	2229F
	Myggenæs	2095C
MZ	Mizen Head ...	2071
M2	Los Angeles Cal. Stn.	2766E
N	East Point	2952N
	Grand Manan I. ...	2950
	McInnes I.	2734H
	Nottingham Island	2962W
	Spotted I.	2960S
NA	Nakke Hoved ...	2113D
	Rona	2029D
NÄ	Shumshu Consol ...	2518B
NB	Berdyanskiy Nizhniy	2313C
	Nab Tower	2005
NF	North Foreland ...	2055
NG	Ostrov Nayssar ...	2139N
NH	Nakhodka	2497N
NI	Mys Nikodimskiy ...	2554J
	Nidingen	2178
NK	Inchkeith Cal. Stn.	2041
NL	Lundy I.	2012
	Neuland	2120F
	Nolsø	2095E
	Zaliv Nabil' ...	2508P
NM	Mys Chesmenskiy ...	2551K
	Nojima Saki ...	2484
NN	Nygrån	2157F
NO	Ölands Norra Udde	2170E
$\overline{\text{NO}}$	New Orleans Lt. V.	2889G
NP	Nieuwpoort ...	2076C
	Nowy Port	2128N
	Punta Carena ...	2279E
NR	Ilha da Moela ...	2827F
	Mys Bol'shoy Lyamchin Nos ...	2546L
	Noord Hinder Lt. V.	2078
	North Ronaldsay ...	2033
NS	Norrskär	2153B
NT	Shvedskiy	2546S
	Yun-Yakha ...	2542J
NU	Nyaku Shima ...	2469P
NX	Paranaguá	2827
NY	Maki	2468A
NZ	Mys Nizmennyy ...	2499
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N2	Point Blunt Cal. Stn.	2760G
O	Barnegat Lt. V. ...	2918E
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	East Cape	2857
	Filtvet	2182
	Halfway Rock ...	2935C
	Kopervik	2190D
	Lake Huron Lt. V. ...	2941D
	Oak Island	2904D
	Point Arguello ...	2765
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	Triple Islands ...	2733C

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	Nagao Hana ...	2468w
OC	Mys Lovtsova ...	2517l
OD	Odderøya	2187
	Odesskiy	2305
	Świnoujście... ...	2125
OE	Oostende	2076j
ŌĒ	Cape Blanco ...	2755
	Dry Tortugas ...	2895g
	Duluth Harbour ...	2944l
	Ile du Corossol ...	2954n
	Manana I.	2935f
	Sturgeon Bay Canal	2947t
	Whitefish Point ...	2945y
OH	Ostrov Kharlov ...	2557
OK	Ostrov Kolguyev ...	2547d
OM	Stroma	2034
ON	*Nan-san-shan Tao...*	*2451d*
	Orrengrund ...	2146b
OR	Mys Ostrovnoy ...	2498c
	Oigh Sgeir	2029b
	Ostrov Bol'shoy Oleniy	2557c
	Ostrov Osmussar ...	2139b
ORC	Isla Orchilla ...	2845b
ŌT	Cape Sarichef ...	2648d
	Detour Reef ...	2942e
	La Pointe	2944z
	Ludington	2949k
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OU	Ose Saki	2469v
OW	Orlova	2507
OY	Sōya Misaki ...	2460
OZ	Daiō Saki	2479g
O2	Alki Pt. Cal. Stn. ...	2744f
ØF	Aalborg Bugt Lt. V.	2107
ÖG	Ölands Södra Grund	2171h
ÖI	Mys Chirikova ...	2513
ÖN	Mys Chibuynyy ...	2518a
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ÖR	Orskär	2162n
ÖW	Zaliv Chr[illegible]vo ...	2508l
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	Cape Flattery ...	2747e
	Chesapeake ...	2906
	Matinicus Rk. ...	2936
	Peckford I....	2959b
	Pine Island... ...	2734p
	Point Betsie ...	2949r
	Point Petre ...	2937m
	Pointe Plate ...	2957
	Point Sur	2764
	Port Arthur ...	2943x
	Saint Paul Island ...	2952f
	Stratford Shoal ...	2926
	Tree Pt.	2732
	Two Harbors ...	2944j
PA	Mys Pakrinem ...	2139d
	Mys Peschanyy ...	2504
PB	Horsburgh	2428q
PB	Paramaribo ...	2841e
PC	Pitsundskiy ...	2320e
PF	Punta Lividonia ...	2277f
PG	Ostrov Shpanberga	2517p
PI	Cabo Espichel ...	2242d
	Rönnskär	2157h
PIL	Brazos Santiago ...	2882
PM	Capo Palinuro ...	2279h
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	Palmi Do	2452a
	Punta Mogotes ...	2814h
PN	Ile du Planier ...	2264d
	Port Menier ...	2954w
	Suyŏng	2455w
	Zaliv Pil'tun ...	2508h
PO	Fiumara Grande ...	2277t
	Korsö	2151c
	Mys Povorotnyy ...	2498
PQ	Porquerolles ...	2265e
PR	Ile du Pilier ...	2221t
	Porkkala	2149
	Practicos Recalada Lt. V.	2815
PS	Cabo Peñas... ...	2230r
PT	Pantelleria	2282c
	Poti	2322
	Souter Cal. Stn. ...	2045
PV	Capo Spartivento ...	2282p
PY	Point of Ayre ...	2022e
PZ	Cozzo Spadaro ...	2282f
	Pointe du Portzic Cal. Stn.	2219l
PZSR	Suriname Rivier Lt. V.	2841g
P2	Diamond Head Cal. Stn.	2626e
Q	Cape Cod	2933
	Cape Otway ...	2591
	Cape Race	2958g
	Churchill	2963h
	Egg I.	2734l
	Hillsboro Inlet ...	2898
	Michipicoten I. ...	2943q
	Point Retreat ...	2695
	Point Wilson ...	2746
	Sambro Island ...	2951d
	San Luis Obispo ...	2764d
	Tibbetts Pt. ...	2937f
QH	Ch'in-huang-tao ...	2449n
QI	Little Quoin I. ...	2411h
QINA	Isla Quiriquina ...	2798e
QS	Casquets	2062
Q2	Guard Is. Cal. Stn....	2727g
R	Burlington Bay ...	2937z
	Butler Flats ...	2929d
	Cap des Rosiers ...	2952v
	Cape Roseway ...	2950u
	Michipicoten Harbour	2943j
	Radio Island ...	2962c
	Rundodden ...	2979
	Saint Johns ...	2901e
	Snug Harbour ...	2941x
	Umatilla Lt. V. ...	2748f

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RÄ	Rataskär	2159
RB	Mys Kurbatova ...	2518C
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	Rumeli Burnu ...	2325R
RC	Cabo Roca	2240E
RD	Roches Douvres ...	2217L
	Trieste	2293F
RE	La Rochelle ...	2222R
	Cape Warwick ...	2962D
RF	Rote Kliff	2092D
RG	Raufarhöfn... ...	2987R
	Tramandai	2825G
RK	Kosa Russkaya Koshka	2525A
$\overline{\text{RK}}$	Delaware Lt. V. ...	2912X
RL	Mys Siama	2519
RM	Gulyayevskaya Koshka	2546R
	Mys Krutova ...	2538B
	Mys Payndte ...	2542C
	Mys Zheleznyy Rog	2316R
RN	Reykjanes	2983D
	Rödkallen	2157C
	Røsnæs Puller ...	2111
RO	Cabo Silleiro ...	2235Q
	Rozewie	2127E
RØ	Rønne Havn ...	2118B
RP	Grip...	2197D
RR	Round I.	2010
RS	Ristna	2139
RSRN	Selvíkurnef ...	2987B
RT	Mersrags	2136M
$\overline{\text{RT}}$	Belle Isle	2955U
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	Chicago Harbour ...	2948T
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	Manistique	2946Q
	Point au Fer Reef...	2886D
	Rankin Inlet ...	2963J
RV	Pointe Revellata ...	2267G
RW	Mys Numeroniemi...	2558L
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RY	Botsford	2952Q
	Royal Sovereign Lt. V.	2060
RZ	Ramea Islands ...	2956V
S	Ostrov Nayssar Cal. Stn.	2139N
	Świnoujście Cal. Stn.	2125
SA	Sable Island ...	2951P
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SÄ	Pos'yeta Consol ...	2945C
SB	Segunda Barranca...	2812N
	South Bishop ...	2017
SC	Sosnovetskiy ...	2554N
SD	Sandettié Lt. V. ...	2210M
	Sidon	2329D
SDN	Gotska Sandön ...	2167
SE	Skagsudde	2160D
SÉ	Pointe Sénétose ...	2268
SÉ	Sète	2263
SF	Ostrov Spafar'yeva	2512
	Skardhsfjara ...	2989
	Stora Fjäderägg ...	2159F
SFI	San Francisco Consolan ...	2757S
SG	Kattegat S.W. Lt. V.	2111B
	Sfântul Gheorghe ...	2302S
SH	Skagen Havn ...	2104F
SI	Sagar I.	2421
SK	Avachinskiy ...	2519G
	São Tomé	2831D
	Skallen	2180B
	Skomvær	2202S
	Smiths Knoll Lt. V.	2052
	Vopnafjördhur ...	2987V
	Sevilla Consol ...	2249S
SL	Slåtterøy	2192
	Sletterhage... ...	2108F
	Spurn Lt. V. ...	2048
SM	Cabo de S. Maria ...	2244D
	Mys Sukhumiyskiy	2321A
	Mys Syurkum Aukan	2506
	Pointe St. Mathieu	2219F
	Sandhammaren ...	2174D
	Shambles Lt. V. ...	2007
	Shio Misaki... ...	2479C
SN	Cabo Sines	2243
	Ile de Sein	2220
	Mys Set'-Navolokskiy	2558
	Sletnes	2207H
SO	Les Sables d'Olonne	2222D
SÖ	Ölands Södra Udde	2171P
	Sochi	2319
SP	Cabo Espartel ...	2353E
	Start Point... ...	2008
SR	Skerries	2018
	Stubbenkammer ...	2122G
SS	Simpnäsklubb ...	2163M
ST	Sakata	2467P
	Stevns Klint ...	2116
STR	Stralsund Cal. Stn.	2122A
SU	South Rock Lt. V. ...	2066D
SV	Skagens Rev Lt. V.	2104D
SW	Cabo de Santa Marta Grande ...	2826
	Mys Khersones ...	2309F
	Mys Svyatoy Nos ...	2556E
	Ostrov Skryplëva ...	2946
SY	Svinøy	2195
	Syrve	2136B
T	Albert Hd. Cal. Stn.	2740L
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	Cape Spencer ...	2691
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	Parry Sound Cal. Stn.	2941W
	Partridge I. Cal. Stn.	2950A
	Point Atkinson Cal. Stn.	2737G
	Québec Cal. Stn. ...	2953Z
	Rivière-du-Loup Cal. Stn.	2953P

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TA	Peschanyy Yeniseyskiy	2537Y
TB	Mys Teriberskiy	2557E
TC	Ethelda Bay	2734E
	Teshio	2460G
TD	Tendrovskiy	2307
	Todo Saki	2487
	Travemünde	2121N
TF	Cabo Tres Forcas	2350D
TG	Terschellingerbank Lt. V.	2082D
	Torsvåg	2205C
	Tsurugi Saki	2481E
TI	Cap d'Antifer	2214E
	Toi Misaki	2472
TJ	Chëshskiy	2547J
	Tynemouth	2044
TL	Mys Tyl'skiy	2509M
	Termoli	2288E
	Träslöv	2177
TM	Tumaco	2787E
	Shioya Saki	2486
TN	Capo San Vito	2284
	Tango	2468U
	Thyborøn	2102D
TNTS	Thessalonîki	2300G
TO	Isola del Tino	2276D
	Tersko-Orlovskiy	2555D
	Torungen	2184T
TP	Tappi Saki	2467C
TR	Mys Tarkhankut	2308
	Mys Terpeniya	2508S
	Trelleborg	2175E
	Tuskar Rock	2068
TRI	Tripoli	2340B
TS	Islas de Todos Santos	2770G
	Tees	2045H
TUK	Nantucket Consolan	2930N
TÜ	Tetyukhe	2499W
TY	Tory I.	2074
TZ	Gibraltar Point	2937R
U	Cape Cod Canal	2933A
	Harbor Beach	2941A
	Natashquan Pt.	2955H
	New Dungeness	2746E
	Puerto Cortés	2776
UB	Travemünde Cal. Stn.	2121N
UI	Isola d'Ustica	2281
UK	Sunk Lt. V.	2053D
	Utklippan	2172H
UL	Bassurelle Lt. V.	2103M
	Ulkokalla	2153N
UN	Understen	2163G
	Unoo Saki	2486B
UÖ	Utö	2150
UPR	Mys Uelen	2527
UR	Burö	2180
	Mys Chernyy	2556G
	Kushiro Saki	2490E
US	Ustka	2127
UT	Kiritappu	2491F
	Utsira	2190H
$\overline{UT}$	Amour Point	2955P
	Calcasieu Pass	2886
	Cape Decision	2715E
$\overline{UT}$	Five Fathom Lt. V.	2917E
	Savannah	2902
	Willapa Bay	2751
ÜG	Ostrov Gogland	2140G
ÜH	Eckmühl	2220H
V	Point Atkinson	2737G
	Port Weller	2938G
VASO	Punta Angeles	2796D
VC	Cabo de S. Vicente	2243E
VD	Vardø	2208C
VG	Ostrov Zhizhginskiy	2551E
	Sydostbrotten	2160C
VI	Cabo Villano	2233D
VL	Shumshu Consol	2518B
VN	Capo Vaticano	2279M
VND	Booby I.	2585A
VNE	Gabo Island	2596
VNP	Cape Leveque	2586V
VR	Mys Dzhonkiyer	2506G
	Pointe de Grave Cal. Stn.	2224
	Utvær	2194
	Vila Real de Santo Antonio	2245
VS	Cabo Estay	2235C
	Vieste	2287V
VUF	False Pt.	2421B
VUK	Khânderi Island	2418E
VUR	Okha	2417G
VUS	Diu Head	2417M
VUU	Vengurla Rocks	2419E
VV	Vishv	2168B
VY	Vyl Lt. V.	2101
VZ	Ile Lavezzi	2268G
W	Cape Hinchinbrook	2684
	Cape San Blas	2893
	Cape Whittle	2955L
	Cove Point	2911
	Los Angeles	2766E
	Marquette	2945V
	Oswego	2938S
	Poe Reef	2942L
	Yaquina Head	2754
WA	Hemsö	2160F
WD	Vaydagubskiy	2558J
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WE	Weser Lt. V.	2087H
WG	Hälsingborg	2176H
WH	West Hinder Lt. V.	2076M
WL	Mys Van-der-Lind	2517V
	Wang Lan	2435C
WN	Warnemünde	2121W
WP	Mys Veprevskiy	2549R
WR	Mys Voronov	2549C
	Vorontsovskiy	2305H
WW	Ventspils	2135H
X	Galveston	2883B
	Grays Reef	2946F
	Owen Sound	2941V
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X	Point Grenville ...	2749B
	Pollock Rip Lt. V. ...	2931E
	Punta Tuna ...	2856
	Sandusky Harbour	2939X
	Smith Point ...	2908D
Y	Cape Arago ...	2754E
	Cape d'Or	2950J
	Erie Harbour ...	2940N
	Flowers I.	2956D
	Indiana Harbour ...	2948Z
	Main Duck I. ...	2937J
	Minneapolis Shoal...	2947L
	Montauk Pt. ...	2925D
	Point Hueneme ...	2765B
	Scatarie Island ...	2951X
	Tête de Galantry ...	2957G
	West Quoddy Head	2936G
YA	Alfa (O.W.S.) ...	2992A
	Shiriya Saki ...	2464
YB	Bravo (O.W.S.) ...	2992B
YC	Charlie (O.W.S.) ...	2992C
	IJmuiden Cal. Stn.	2080B
YD	Delta (O.W.S.) ...	2992D
	Ystad	2174Q
YE	Echo (O.W.S.) ...	2992E
	Ile d' Yeu	2221Y
YEK	Belawan	2569G
YG	Yangishiri Shima ...	2460K
YI	India (O.W.S.) ...	2992I
YJ	Juliett (O.W.S.) ...	2992J
YK	Kilo (O.W.S.) ...	2992K
YM	IJmuiden	2080B
	Mike (O.W.S.) ...	2992M
YN	November (O.W.S.)	2629N
YO	Yüan Tao	2451F
YP	Papa (O.W.S.) ...	2629P
YQ	Churchill	2963G
YS	Iso Saki	2485M
YV	Victor (O.W.S.) ...	2629V
Y2	Point Loma Cal. Stn.	2768E
Z	Aransas Pass ...	2882D
	Boston Lt. V. ...	2934
	Cape Kennedy ...	2899E
	Columbia Lt. V. ...	2753
	Lansing Shoal ...	2946J
	Makapuu Pt. ...	2626C
Z	Pigeon Pt.	2763
	Port Colborne ...	2929C
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	Scotch Cap... ...	2650D
	Toledo Harbour ...	2939T
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ZB	Zeebrugge	2077
ZG	Mys Kharasovay ...	2542M
ZLOA	Baring Head ...	2610F
ZLOC	Cape Reinga ...	2603
ZLOD	Stephens I.... ...	2605
ZLOE	Portland I.... ...	2611D
ZLOJ	Dog I.	2607F
ZLOK	East Cape	2611J
ZLOM	Burgess Islet ...	2613G
ZLON	Godley Head ...	2609C
ZLOP	Puysegur Pt. ...	2607
ZLOQ	Taiaroa Head ...	2608C
ZLOV	Cuvier I.	2613D
ZLTK	Napier Cal. Stn. ...	2611A
ZM	Ostrov Zmeinyy ...	2303
ZN	Echizen Misaki ...	2468P
ZO	Mys Zolotoy ...	2503
ZQ	Mys Men'shikova ...	2544M
ZR	Mys Ozernoy ...	2521N
ZRE	Mbashe Pt. ...	2390G
ZRF	Cape St. Blaize ...	2388M
ZRT	Dias Point	2385F
ZS	Coral Harbour ...	2962Z
	Mys Bolvanskiy Nos	2544B
ZSY	Hood Pt.	2390
ZSZ	Cape Columbine ...	2386
ZTD	Port Shepstone ...	2930S
ZTY	Cape Recife ...	2389E
ZU	Mys Tonkiy ...	2543G
ZUA	Swakopmund ...	2385
ZUH	Cape Point	2388
ZUI	Robben Island ...	2386E
ZUM	Cape St. Francis ...	2388S
ZUQ	Cape St. Lucia ...	2392D
ZUT	Cooper	2392
ZUV	Pelican Point ...	2385E
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ZUY	Cape Agulhas ...	2388E
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9KU	Mīnā' al Ahmadī ...	2412F

RADIOBEACONS—SERVICE DETAILS

Mariners are warned that Radiobeacons are liable to suspend operation, without notice, for varying periods owing to minor defects, maintenance work, etc.

For information regarding promulgation of temporary changes, see the introductory portion of this section of the volume, under the heading *Notes (temporary)*.

NOTES.—(1) The number of the relevant Radiobeacon Diagram (if any) is given on each page of this section (thus: *5477*), usually in the top right hand corner.

(2) An asterisk, in bold type, placed to the left of the name of a radiobeacon (thus: ***Sunk Lt. V.**), indicates that the station is omitted from the Radiobeacon Diagram owing to limitations of scale.

(3) In the Grouping tables, the reference marks placed against the Sequence Numbers have the following meanings:

* This station gives *no* scheduled transmissions in clear weather.

† This station, *unlike certain others in the same group*, gives Clear Weather Transmissions, i.e. limited scheduled transmissions in clear weather (for times see service details).

‡ See details given in footnote.

GRFAT BRITAIN

5477

2005 Nab Tower Lt. Ho. (A0780). 50° 40′ 03″ N. 0° 57′ 04″ W.

(I) RADIOBEACON

FREQUENCY: 298·8. A2. RANGE: 20 miles. SE[illegible]NCE No.: III, VI.

CHARACTERISTIC: Period 6 min.

Signal Group:		
NB (—· —···) 4 times	19·6 sec.	(3 min.).
Long dash (——)	25·0 ,,	
NB (—· —···) twice	9·1 ,,	
Silent	126·3 ,,	
Repetition of Signal Group.....	180·0 ,,	(3 ,,).
Period.....	360·0 sec.	(6 min.).

CLEAR WEATHER TRANSMISSIONS: None.

FOG SERVICE: Continuous, commencing at 02 min. past the hour.

GROUPING:					
2216D	Pointe de Ver	ÉR	I, IV	20	miles.
2217H	Cherbourg	"Cherbourg"	*II, V	‡30	,,
2005	Nab Tower	NB	*III, VI	20	,,

‡ Transmits continuously in fog with Period 1 min., but range is reduced to 8 miles while 2216D and 2005 are transmitting.

(II) CALIBRATION STATION

FREQUENCY: 312·6. A2. RANGE: 5 miles.

CHARACTERISTIC: Period 1 min.

NB (—· —···) 4 times	19·6 sec.	
Long dash (——)	25·0 ,,	
NB (—· —···) twice	9·1 ,,	
Silent	6·3 ,,	
Period.....	60·0 sec.	(1 min.).

SERVICE: 0800—0900 and 1200—1300 (clock time); also on request.

(See page 74.)

MOROCCO—continued

5482, 5484

Aero Radiobeacons—continued

Atlantic Coast—continued

ESA **Es-suira (Essaouira) (Mogador).** (*P.A.*) (*3257*) 31° 30′ N. 9° 45′ 30″ W.
FREQUENCY: 288. A0, A2. RANGE: Low.

CNL **Kenitra (Port Lyautey).** 34° 17′ 34″ N. 6° 37′ 20″ W.
FREQUENCY: 380. A2. 0·3 kW.

KJ **Rabat—Salé.** 34° 02′ 55″ N. 6° 46′ 33″ W.
FREQUENCY: 255. A1. 0·4 kW.

SFI **Safi.** 32° 18′ N. 9° 10′ W.
FREQUENCY: 400. A1. 0·04 kW.

IF **Sidi Ifni (Sp.).** 29° 22′ 12″ N. 10° 10′ 44″ W.
FREQUENCY: 258. A1. 0·7 kW.

TBR ***Tanger (Tangier) (Boukhalf) (Buhalt).** 35° 44′ 34″ N. 5° 50′ 41″ W.
FREQUENCY: 324. A2. 0·5 kW.

TSE **Tnine de Sidi El Yamani.** 35° 23′ N. 5° 58′ W.
FREQUENCY: 338. A0. 0·1 kW.

SPANISH SÁHARA

5484

2359B **Cabo Bojador Lt. Ho.** (D2624). 26° 07′ 23″ N. 14° 29′ 22″ W.
FREQUENCY: 291·9. A2. RANGE: 100 miles. SEQUENCE No.: V, VI.

CHARACTERISTIC: Period 6 min.

BJ (— · · · · — — —) 4 times ...	20 sec.	(1 min. 50 sec.).
Long dash (——)	25 ,,	
BJ (— · · · · — — —) 6 times ...	30 ,,	
Long dash (——)	25 ,,	
BJ (— · · · · — — —) twice	10 ,,	
Silent	250 ,,	(4 ,, 10 ,,).
Period.....	360 sec.	(6 min.).

BEACON SERVICE: Continuous, commencing at 04 min. past the hour.

Aero Radiobeacons (see page 65)

AI **El Aaiún.** 27° 08′ 58″ N. 13° 11′ 15″ W.
FREQUENCY: 390. A1. 0·3 kW.

CD **Villa Cisneros.** (*P.A.*) (*2078*) 23° 42′ 51″ N. 15° 55′ 24″ W.
FREQUENCY: 359. A1. 1·2 kW.

AÇÔRES

Aero Radiobeacons (see page 65)

FS **Flores.** (*1946*) 39° 22′ 28″ N. 31° 10′ 21″ W.
FREQUENCY: 270. A1. RANGE: 150 miles.

GRA **Graciosa.** 39° 05′ N. 28° 01′ W.
FREQUENCY: 283. A2. RANGE: 100 miles.

HOR **Horta, Faial.** 38° 31′ 47″ N. 28° 37′ 59″ W.
FREQUENCY: 308. A2. RANGE: 100 miles.

LJ **Lajes, Terceira (I).** 38° 42′ 30″ N. 27° 09′ 30″ W.
FREQUENCY: 396. A2. RANGE: 300 miles.

PANAMA AND CANAL ZONE—continued *5493, 5494*

Aero Radiobeacons (see page 65)

FTD **Cristóbal (France Field),** *Caribbean Coast.* 9° 22′ 00″ N. 79° 52′ 29″ W.
FREQUENCY: 326. A0, A2. 2·5 kW.

TA **David.** 8° 23′ N. 82° 26′ W.
FREQUENCY: 350. 1·2 kW.

TBG **Isla Taboga.** 8° 47′ 09″ N. 79° 33′ 39″ W.
FREQUENCY: 311. A0, A2. 2·5 kW.

R ***Tocumen, Panamá City.** 9° 05′ N. 79° 23′ W.
FREQUENCY: 250. 0·05 kW.

COLOMBIA (Pacific Coast)

2787c **Punta Soldada Lt. Ho.** (G3132). (*2319*) 3° 48′ 51″ N. 77° 10′ 36″ W.
FREQUENCY: 317. A2.
CHARACTERISTIC: Period 3 min.
BT (— • • • —), etc..... 1 min.
Silent ..... 2 „
Period..... 3 min.
BEACON SERVICE: Continuous.

2787e **Tumaco (Isla del Morro)** (G3124). 1° 50′ 42″ N. 78° 43′ 14″ W.
FREQUENCY: 285. A2. RANGE: 250 miles.
CHARACTERISTIC: Period 3 min.
TM (— — —)..... 1 min.
Silent ..... 2 „
Period..... 3 min.
BEACON SERVICE: 10—20 and 40—50 min. past each hour.

Aero Radiobeacons (see page 65)

BUN **Buenaventura.** 3° 51′ N. 76° 58′ W.
FREQUENCY: 1,710. 1·0 kW. SERVICE: By day.

TCO **Tumaco, Isla del Morro.** (*2257*) 1° 49′ 47″ N. 78° 44′ 36″ W.
FREQUENCY: 355. A2. 1·0 kW. SERVICE: By day.

ECUADOR

Aero Radiobeacons (see page 65)

GLA **Archipiélago de Colón (Galápagos Islands) (Seymour)—Isla Baltra.** 0° 27′ S. 90° 16′ W.
FREQUENCY: 272. 1·0 kW. SERVICE: Occas.
CALL STATION: Guayaquil (HCG) (789).

ESM **Esmeraldas (Genaral Rivadeneira).** 0° 59′ 53″ N. 79° 40′ 37″ W.
FREQUENCY: 385. 0·75 kW.

UIL **Guayaquil (Simon Bolivar).** 2° 10′ 32″ S. 79° 53′ 43″ W.
FREQUENCY: 365. A0, A2, 1·0 kW.

MNT **Manta (Eloy Alfaro).** 0° 57′ S. 80° 41′ W.
FREQUENCY: 300. 0·5 kW. SERVICE: By day.

SLS **Salinas (General Ulpiano Paez), Punta Santa Elena.** 2° 12′ 40″ S. 80° 59′ 16″ W.
FREQUENCY: 515. 0·4 kW. SERVICE: By day.

JAMAICA—continued *5494*

Aero Radiobeacons (see page 65)

6YK	**Kingston (Palisadoes).**		17° 57′ 48″ N.	76° 52′ 33″ W.
	FREQUENCY: 360.	A0, A2.	RANGE: 250 miles.	
6YM	**Montego Bay.**		18° 30′ 10″ N.	77° 55′ 08″ W.
	FREQUENCY: 248.	A0, A2.	RANGE: 150 miles.	

CAYMAN ISLANDS

Aero Radiobeacons (see page 65)

ZIY	**Grand Cayman (Owen Roberts).**		19° 17′ 12″ N.	81° 23′ 30″ W.
	FREQUENCY: 344.	A0, A2.	1·0 kW.	

CUBA

Aero Radiobeacons (see page 65)

UBO	**Batabano.**	(*P.A.*)	22° 41′ 15″ N.	82° 17′ 00″ W.
	FREQUENCY: 296.			
CMM	**Camaguey (Ignacio Agramonte).**		21° 25′ N.	77° 51′ W.
	FREQUENCY: 370.	A0, A2.	1·2 kW.	
UCF	**Cienfuegos (Jaime Gonzales).**		22° 09′ N.	80° 21′ W.
	FREQUENCY: 212.		1·2 kW.	
UGN	**Giron.**	(*P.A.*)	22° 04′ 30″ N.	81° 02′ 30″ W.
	FREQUENCY: 230.			
NBW	**Guantánamo Bay (McCalla).**		19° 53′ 11″ N.	75° 09′ 25″ W.
	FREQUENCY: 323.	A0, A2.	RANGE: 25 miles.	
UHA	**Habaña (Havana) (Jose Marti) (I).**		22° 58′ N.	82° 26′ W.
	FREQUENCY: 348.			
A	***Habaña (Havana) (Jose Marti) (II).**		22° 55′ 57″ N.	82° 29′ 30″ W.
	FREQUENCY: 339.			
CMG	**Holguin.**		20° 51′ N.	76° 07′ W.
	FREQUENCY: 278.		0·35 kW.	SERVICE: By day.
UIS	***Isabela.**		22° 54′ 50″ N.	80° 02′ 18″ W.
	FREQUENCY: 305.			
UPA	**Punta Alegre.**	(*2009*)	22° 22′ 30″ N.	78° 47′ 18″ W.
	FREQUENCY: 382.		RANGE: 50 miles.	
USR	**Quince y Medio.**		21° 45′ N.	78° 49′ W.
	FREQUENCY: 315.			
SAT	***San Antonio (Habaña South-West).**		22° 55′ N.	82° 29′ W.
	FREQUENCY: 382.		0·1 kW.	
~~SAJ~~	~~San Julian.~~		~~22° 05′ N.~~	~~84° 18′ W.~~
	~~Frequency: 396.~~		~~0·1 kW.~~	
USF	***Santa Fe (Habaña North-West).**		23° 04′ N.	82° 31′ W.
	FREQUENCY: 412.		1·2 kW.	
CMH	**Santiago.**		19° 57′ 30″ N.	75° 52′ W.
	FREQUENCY: 339.	A0, A2.	1·2 kW.	SERVICE: By day.
UVR	***Varadero (Coronel Pascual).**		23° 05′ N.	81° 16′ W.
	FREQUENCY: 272.		0·1 kW.	SERVICE: By day.
UZG	***Zaragoza.**		22° 56′ 03″ N.	82° 02′ 20″ W.
	FREQUENCY: 283.		0·25 kW.	

BAHAMAS (5494)

"QTG" Service (see page 68)

~~Coupons: 6·25 francs (gold) per minute. Payable to: Cable and Wireless Ltd., Mercury House, 110/124, Theobalds Road, London, W.C.1.~~

~~Turks Island (VSI) (874) 21° 28′ 18″ N. 71° 09′ 04″ W.~~

Aero Radiobeacons (see page 65)

ZBB	***Bimini.** FREQUENCY: 396.	(*P.A.*) 25° 42′ 30″ N. 2·0 kW.	79° 17′ 12″ W.
ELJ	***Eleuthera Military.** FREQUENCY: 224.	(*P.A.*) 25° 17′ 00″ N. 0·1 kW.	76° 18′ 36″ W.
RSD	***Eleuthera (Rock Sound).** FREQUENCY: 353.	24° 56′ N. 0·05 kW.	76° 11′ W.
ZFP	***Grand Bahama (Freeport).** FREQUENCY: 209.	26° 31′ 06″ N. RANGE: 100 miles.	78° 46′ 30″ W.
ZWE	***Grand Bahama (West End).** FREQUENCY: 317.	26° 41′ 22″ N. 0·1 kW.	78° 58′ 47″ W.
GBN	**Grand Bahama Military.** FREQUENCY: 326.	26° 37′ 03″ N. 0·1 kW.	78° 21′ 29″ W
GT	**Grand Turk.** FREQUENCY: 232.	21° 28′ 15″ N. RANGE: 50 miles.	71° 08′ 31″ W.
ZIN	**Great Inagua.** FREQUENCY: 376.	20° 58′ 09″ N. RANGE: 50 miles.	73° 40′ 09″ W.
ZQA	**Nassau, New Providence Island.** FREQUENCY: 251. A1.	25° 08′ N. 1·0 kW.	77° 29′ W.
~~SSI~~	~~San Salvador.~~ ~~FREQUENCY: 291.~~	~~24° 04′ 08″ N. 0·0 kW.~~	~~74° 32′ 15″ W.~~
~~CM~~	~~South Caicos.~~ ~~FREQUENCY: 260.~~	21° [illegible]′ 57″ N. 0·75 kW.	71° 31′ 47″ W.
ZTC	**Treasure Cay, Abaco Island.** FREQUENCY: 233.	(*3042*) 26° 41′ N. RANGE: 50 miles.	77° 18″ W.

BERMUDA ISLANDS

2875G Gibbs Hill Lt. Ho. (J4550). (*332*) 32° 15′ 06″ N. 64° 50′ 00″ W.

FREQUENCY: 295. A2. RANGE: 120 miles.

CHARACTERISTIC: Period 1 min.

BDA (— · · · — · · · · —) 3 times	21 sec.
Silent	4 ,,
Long dash (——)	23 ,,
Silent	12 ,,
Period	60 sec. (1 min.).

BEACON SERVICE: Continuous.

"QTG" Service (see page [illegible])

~~Coupons: 6·20 francs (gold) per minute. Payable to: Cable and Wireless Ltd., Mercury House, 110/124, Theobalds Road, London, W.C.1.~~

~~Bermuda (VBT) (875) 32° 22′ 50″ N. 64° 40′ 01″ W.~~

Aero Radiobeacons (see page 65)

KB	**Kindley, St. David's Island.** FREQUENCY: 375.	(*868*) 32° 21′ 13″ N. RANGE: 50 miles.	64° 39′ 34″ W.

NOTE.—For stations on the Caribbean Coast of the Central American Republics and Panama Canal Zone, see page 412 et seq.

BRITISH HONDURAS 5494

Aero Radiobeacons (see page 65)

ZDZ **Belize.** 17° 32′ 04″ N. 88° 18′ 07″ W.
FREQUENCY: 392. 0·6 kW. SERVICE: By day.

SWAN ISLAND

Aero Radiobeacons (see page 65)

SWA **Swan Island.** 17° 24′ 25″ N. 83° 56′ 29″ W.
FREQUENCY: 407. 2.0 kW.

MEXICO (Gulf Coast)

2879D **Isla de Sacrificios Lt. Ho., Vera Cruz** (J4278). 19° 10′ 26″ N. 96° 05′ 37″ W.
FREQUENCY: 305. RANGE: 250 miles.
CHARACTERISTIC: Period 1 min.
IS (• • • • • •) .....
18 short dashes (— — — etc.) ..... } 1 min.
Long dash (——) .....
BEACON SERVICE: Continuous.

2881C **Tampico.** 22° 15′ 28″ N. 97° 50′ 10″ W.
FREQUENCY: 385. 0·1 kw.
SIGNAL: AA (• — • —).
BEACON SERVICE: 00—10 and 30—40 min. past the hour.

Aero Radiobeacons (see page 65)

CPE **Campeche.** 19° 50′ 07″ N. 90° 30′ 36″ W.
FREQUENCY: 227. A1, A2. 0·05 kW. SERVICE: By day.

CME **Carmen.** 18° 38′ 37″ N. 91° 48′ 46″ W.
FREQUENCY: 288. A1, A2. 1·2 kW. SERVICE: Occas.

CTM **Chetumal.** 18° 28′ 55″ N. 88° 20′ 18″ W.
FREQUENCY: 262·5. A1. 1·2 kW. SERVICE: Occas.

CZM **Cozumel.** 20° 29′ 18″ N. 86° 57′ 00″ W.
FREQUENCY: 201. A1. 1·2 kW. SERVICE: Occas.

MID **Mérida.** 20° 55′ 48″ N. 89° 41′ 00″ W.
FREQUENCY: 280. A1, A2. 1·2 kW. SERVICE: Occas.

MTT **Minatitlán.** 17° 58′ 03″ N. 94° 30′ 15″ W.
FREQUENCY: 300. A1, A2. 1·2 kW. SERVICE: Occas.

NAU **Nautla.** 20° 12′ 27″ N. 96° 45′ 55″ W.
FREQUENCY: 392. A1, A2. 1·2 kW.

TAM ***Tampico (Rihl).** 22° 18′ 10″ N. 97° 50′ 56″ W.
FREQUENCY: 318. A1, A2. 1·2 kW.

TUX **Tuxpan.** 20° 56′ 32″ N. 97° 22′ 20″ W.
FREQUENCY: 262·5. A1, A2. 1·0 kW.

VER ***Vera Cruz (Las Bajadas).** 19° 08′ 27″ N. 96° 11′ 58″ W.
FREQUENCY: 327. A1, A2. 1·2 kW.

VSA ***Villahermosa.** 17° 59′ 48″ N. 92° 58′ 42″ W.
FREQUENCY: 336. A1, A2. 0·1 kW. SERVICE: By day.

UNITED STATES (Gulf Coast)

2882 **Brazos Santiago, Padre Island, Tex.** 26° 04′ 22″ N. 97° 09′ 53″ W.
SITE: 199°30′ 405 ft. from Brazos Santiago Lt. (J4226).
FREQUENCY: 314. A0, A2. RANGE: 350 miles.
SIGNAL: PIL (• — — • • • — • •).
BEACON SERVICE: Continuous.
REMARKS: Aero-marine.

ALPHABETICAL INDEX OF NUMBERED STATIONS

NOTES.

(1) This index comprises only the numbered series of stations (including " QTG " stations, in respect of which *page references* are given). Aero radiobeacons are not included in the numbered series of stations; they are therefore omitted from this index.

(2) All names commencing with Saint, Sainte, etc., will be found indexed under the letter S.

(3) When a station is indexed under an old name, the correct (accepted) name follows in parentheses. However, where the older form of a name begins with the same letters as the accepted form, the older form is given, in parentheses, *after* the accepted form.

(4) For the purposes of this index, the alphabetical order takes *no* account of diacritical marks, etc.: e.g. ä and å are treated as a, ö and ø as o.

(5) Since stations are indexed under their *proper* names, the English equivalents of foreign geographical terms are not normally given, even though these may appear on certain Admiralty charts. Glossaries of foreign geographical terms are given in the Admiralty Sailing Directions.

SYSTEM OF NUMBERING.

In the various Sections of this publication, each station has been allotted a number for the purpose of readily identifying the different services carried out. The system of indexing is as follows:—

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EXHIBIT 12—Light List, Excerpts

ABBREVIATIONS USED IN ADMIRALTY LIST OF LIGHTS

Alt.	Alternating
Bl.	*Blue*
bl	Blast
Dia.	Diaphone
Dir	Directional light
Discond	Discontinued
Extingd	Extinguished
ecl	Eclipse
Explos.	Explosive fog signal
F.	Fixed
F.Fl.	Fixed and flashing
F.Gp.Fl.	Fixed and group flashing
Fl.	Flashing
fl	Flash
Fog Detr.Lt.	Fog detector light
ft	feet
G.	*Green*
Gp.Fl.	Group flashing
Gp.Occ.	Group occulting
(hor)	Horizontal
Int.Qk.Fl.	Interrupted quick flashing
intens	Intensified sector
Irreg	Irregular
Iso.	Isophase
Lat.	Latitude
Ldg Lts	Leading lights
Long.	Longitude
Lt.	Light (no details known)
lt	Light (Phase)
Lt F	Light-float
Lt V	Light-vessel
M	Sea miles
m	metres
Mo.	Morse code light or fog signal
MV	Mercury vapour discharge lamp, *greenish-white* in colour
min.	minutes
Occ.	Occulting
Occasl	Occasional
Or.	*Orange*, *amber* or *yellow*
(P)	Provisional, preliminary
Qk.Fl.	Quick flashing
R.	*Red*
Ra.	Coast radar station
Racon	Radar responder beacon
Radio	Coast radio station
Ramark	Radar beacon (continuous)
Ra.refl.	Radar reflector
RC	Circular radiobeacon
RD	Directional radiobeacon
RG	Radio direction finding station
R/T	Radio telephone
RW	Rotating loop radiobeacon
sec	Seconds
Sig Stn	Signal station
sil	Silence
SV	Sodium vapour discharge lamp, *orange* in colour
(T)	Temporary
TD	Temporarily discontinued
TE	Temporarily extinguished
unintens	Unintensified sector
(vert)	Vertical
Vi.	*Violet*
Vis	Visible
W.	*White*
Whis.	Whistle

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ABBREVIATIONS USED IN THIS VOLUME

The authorities responsible for maintaining lights are indicated by the following abbreviations in column 2 and in the Index.

(B)	British Commonwealth
(BAH)	Bahamas
(BE)	Bermuda Electric Light Company
(BH)	British Honduras
(BOT)	Board of Trade, London
(BT)	Bermuda Board of Trade
(CO)	Colombia
(CR)	Costa Rica
(CU)	Cuba
(DR)	Dominican Republic
(F)	France
(G)	Guyana
(GU)	Guatemala
(H)	Haïti
(HON)	Honduras
(J)	Jamaica
(M)	Mexico
(N)	Netherlands
(NIC)	Nicaragua
(P)	Panama
(PC)	Panama Canal
(US)	United States of America
(V)	Venezuela

850a

INTRODUCTORY REMARKS

Admiralty List of Lights, Fog Signals and Visual Time Signals, for the world, is issued in twelve volumes, divided geographically as shown on the Index Chart on the back cover.

Light-buoys of an elevation of less than 6 metres (20 feet) are not included in the List.

The volumes are re-published at intervals of about 18 months.

The date to which a volume has been corrected will be found on the front cover and the title page. Section V of the Weekly Edition of Notices to Mariners which contains the Notice announcing the issue of a new volume includes all the corrections which have accumulated since the volume was sent to press; subsequent corrections are included in Section V week by week. All of these amendments should be cut out and pasted in the appropriate places in the List, and their insertion noted on the "Notation of Amendments" sheet at the front of the List. The index should then be amended by the deletion, insertion or correction of names. The more important of these corrections will be issued as a Notice to Mariners for the correction of charts, *but it is emphasised that many alterations to lights, especially those of a* **temporary nature,** *are promulgated only in Section V of Admiralty Notices to Mariners.*

In Section V an empty column implies that no correction has been made; a **heavy** line in any column indicates that the information in that column is to be deleted.

Temporary corrections are printed in **bold** type, in column 8.

Note.—Corrections are not made to copies of the List of Lights stocked by the Hydrographic Department, Admiralty Chart Agents or Admiralty Chart Depots, *and copies received from these sources should be corrected from Section V of Admiralty Notices to Mariners before being brought into use.*

INTERNATIONAL NUMBER OF LIGHTS

The numbers assigned to lights in Admiralty List of Lights, as amended by Section V of Admiralty Notices to Mariners, and prefixed by the Volume letter are the International Numbers, in accordance with the resolutions of the International Hydrographic Bureau.

These letter-figure combinations should be quoted whenever lights are referred to.

DESCRIPTION

Information is tabulated as follows:—

Column 1: Contains the number of each light.

Column 2: Name, position.

Place is printed in CAPITALS.

The names of lights having a range of **15 miles** and over are printed in **bold type;** those of less than 15 miles range are printed in Roman type; those of light-vessels in *ITALIC CAPITALS* and those of all other floating lights in *italics.*

Column 3: Latitude and longitude are approximate.

Column 4: Characteristics and intensity.

Column 5: Elevation, in feet in Roman type and in **metres** in **bold** type.

Column 6: Range in sea miles.

Luminous range is printed in **bold** type if of **15 miles or more,** and in Roman type if less.

Geographical range is printed in *italic* type.

When only one range is listed it is printed in **bold** or Roman type, as appropriate; if this is less than the geographical range it is obviously luminous range, but if the elevation and range are consistent it is geographical range.

These distances may be increased by abnormal atmospheric refraction, or may be reduced by fog, haze, rain, smoke, or by the effect of glare from other lights, etc. *See* "Geographical Range Table" and "Luminous Range Diagram."

Column 7: Description of structure and its height, in feet in Roman type, and in **metres** in **bold** type.

Column 8: Remarks. Phase, sectors, arcs of visibility. Minor lights.

Phase is expressed in seconds unless otherwise stated; it is printed in *italics*.

The durations of light and darkness are those for which the apparatus was designed. In practice they are subject to some degree of fluctuation, due to slight variations in the working speed of the apparatus. The duration of a flash may also appear to be less than normal when seen from a great distance, and haze has the same apparent effect.

The limits of sectors and of arcs of visibility, and the alignment of directional lights and leading lights are given **as seen by an observer from seaward. All bearings refer to the true compass and are measured clockwise from 000° to 359°.**

Coast radio stations, radar stations and radiobeacons are mentioned in the List of Lights when they are situated at a light-station, but for details reference must be made to Admiralty List of Radio Signals.

Signal stations and weather, ice, storm, danger, tide, tidal stream, traffic and port signals are mentioned when they are shown at a light-station; full details will be found in the relevant Admiralty Sailing Directions.

EXPLANATION—LIGHTS

The character of a rhythmic light is quick flashing, flashing, isophase or occulting, solely according to the relative durations of light and darkness, and without any reference to the type of apparatus employed. At short distances, and in clear weather, flashing lights may show a faint continuous light.

Some lights change colour in sectors, some change character, and a few change both colour and character. Others show different colours in succession.

Rhythmic lights produced by rotating apparatus may be detected at ranges greater than the geographical range by the appearance of the loom of the light.

Aeromarine lights are marine-type lights in which a part of the beam is deflected to an angle of 10°–15° above the horizon for the use of aircraft.

Aero lights are often of great intensity and elevation. Their intensity is usually greater than that of most navigational lights and they may be the first lights, or looms of lights, to be sighted when approaching the land. Those likely to be visible from seaward are inserted in the List of Lights; their character is always preceded by the word "Aero". These lights are not designed for marine navigation and they are subject to changes of which prompt notification to the mariner may not always be possible.

Obstruction lights mark radio towers, chimneys and other obstructions to aircraft. Like aero lights, they are not maintained for marine navigation, and the same cautionary remarks apply. They are usually *red* in colour, either *fixed*, *flashing* or *occulting*, but other colours and characters may be employed.

Obstruction lights of high intensity and likely to be visible from seaward are listed with the character preceded by the word "Aero" and with the legend **"Obstruction"** in column 8. Those of less intensity are classified as minor lights and are mentioned in column 8.

CENTRAL AMERICA — NICARAGUA

No. (1)	NAME—Position (2)	Lat. N Long. W (3)	Characteristics *Intensity* (4)	Elevation (5)	Range (6)	Structure (7)	Remarks (8)
6038	Roncador Bank. Roncador Cay (PC)	° ′ 13 34 80 04	Fl.W. 10·0 sec.	52 16	11	Red pyramidal framework tower on tank	*fl 1·0* Lights operate independently and may flash simultaneously or successively: therefore the interval between the flashes may be irregular
			Fl.W. 2·0 sec.	52 16	11	Same structure	*fl 0·2*
	ISLA DE PROVIDENCIA (Co)						
6042	— S. end	13 19·3 81 23·3	Fl.W. 3·0 sec.	180 55	11	..	*fl 0·3*. Vis. 318°–157° (199°)
6043	**Isla San Andrés**	12 35·1 81 41·7	Aero Alt.Fl.W.G. 10·0 sec.	..	**16**	Radio mast	Aero RC
6044	Courtown Cays. Cayo Bolivar. Middle Cay (Co)	12 24·0 81 27·9	Fl.W. 17·0 sec.	110 33	14	Metal tower 95 29	Ra.refl.

8534

S.S. IRISH

Serial No. of Bearings (1)	Date (2)	Times (G.M.T.) (3)	
1	24.9.71	1232	2
2	"	1244	
3	"	1255	
4	"	1401	
5	"	1413	
6	"	1513	
7	"	1431	
8	"	1731	
9	"	1749	
10	"	2201	

EXHIBIT 30—Copy of RDF Verification of Calibration

THE MARCONI INTERNATIONAL MARINE COMMUNICATION COMPANY LIMITED
CHELMSFORD — ENGLAND

SPRUCE / ELSR

VERIFICATION OF CALIBRATION

RECORD OF CHECK-BEARINGS TAKEN BY MEANS OF THE DIRECTION-FINDER

Ship's Approximate Position		Distance from Transmitter	Direction Finder Bearing of (Name)	Direction-Finder reciprocal Bearing Corrected for Q.E.	Ship's Head by Compass 0 to 360°	Total Compass Error	± Convergency Applied	Ship's Head Corrected (True)	True Bearing by Direction-Finder (Col. 8) and Col. (12)	True Bearing by Calculation or by Chart (Check-bearing and/or virtual to be indicated)	Correction required to make (14) equal (13) (allowing weather — or +)	Signature of Observer or Observers
Latitude	Longitude											
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
29°20'	94° 42'	3 miles	GALVESTON SEAWALL LIGHT	042	074	Nil	Nil	074	116	113	-3	W F Hayes A/O
"	"	"	"	061	053	"	"	053	114	114	-½	J. O'Connell 3/
"	"	"	"	055½	059	"	"	059	114½	114	-½	
"	"	"	"	143½	335	"	"	335	115½	114½	-4	
"	"	"	"	144	331	"	"	331	115	114½	-½	
"	"	"	"	200½	275	"	"	275	115½	114½	-1	"
"	"	"	"	199	276	"	"	276	115	114½	-½	
"	"	"	"	223½	253	"	"	253	116½	115	-1½	
"	"	"	"	225½	250	"	"	250	115½	115	-½	"
"	"	"	"	037	082	"	"	082	119	116½	-2½	"

FORM NO. S.M. PRINTED IN ENGLAND

8540

EXHIBIT 52—Photocopy of Healy's Book (entire)

FRANK'S "LITTLE RED BOOK"

V. IRISH SYCAMORE — VOY. Nº 50

BIRKENHEAD TOWARDS U.S.A. FOR ORDERS.

LIVERPOOL BAR [½' NORTH OF LT. VL.]		
TO	COURSE 271°	DIST. 4·9'
SKERRIES [BRG 155° × 9']		
TO	COURSE 212°	DIST. 98'
TUSKAR [302° × 3']		
TO	COURSE 231°	DIST. 9'
ABEAM BARRELS BUOY.		
TO	COURSE 249°	DIST 87'
OLD HD. OF KINSALE [334° × 3']		
TO	COURSE 252°	DIST. 42½'
FASTNET RK. [342° × 3']		

TOTAL DIST. L'POOL BAR TO FASTNET	285½ MILES
TOTAL DIST. SKERRIES TO FASTNET	236½ "
TOTAL DIST. SKERRIES TO OLD HD. KINSALE.	194 "

MERCATOR FROM:- FASTNET RK. LAT. 51°-20·5N LONG 9°-34·5' W
TO:- N.E. PROVIDENCE CHANNEL. LAT. 25°-46·5N LONG 77°-10·0' W
COURSE:- 244°(T) DISTANCE 3480 MILES.

ABACO LT. [334° × 4·9']		
TO	COURSE 282°	DIST. 108'
GT. ISAAC LT. [192° × 7·4']		
TO	COURSE 238°	DIST. 62'
FOWEY RKS [248° × 3']		
TO	COURSE 189°	DIST. 15'
PACIFIC RKS [279° × 3']		
TO	COURSE 205°	DIST. 10·5'
CARYSFORT RK. [295° × 2·6']		
TO	COURSE 215°	DIST. 16'
MOLASSES I'VES. [305° × 2·65']		

Molasses Reef [305° x 2·65′]		
To	Course 232°	Dist. 17·2′
Alligator Reef [322° x 3·1′]		
To	Course 235°	Dist. 11·2′
Tennessee Bk. Lt. [325° x 3′]		
To	Course 250°	Dist. 20′
Sombrero Lt. [340° x 2·5′]		
To	Course 255°	Dist 43·3
Sand Cay [345° x 3·2′]		
To	Course 270°	Dist. 31′
Int. Qk. Fl. Buoy [000° x 1·7′]		
To	Course 285°	Dist. 33′
Dry Tortugas [040° x 7′]		

Total distance Gt. Abaco Lt. to Dry Tortugas 367 miles.

Mercator:- From Dry Tortugas. Lat. 24° - 33′ N Long 83° - 00′ W
To S.W. Pass. Lat. 28° - 52′ N Long 89° - 26′ W
Course :- 307°(T) Distance 433 miles.

Distances:-

L'pool Bar to Fastnet	286
Fastnet to Abaco Lt.	3480
Abaco Lt. to Dry Tortugas.	367
Dry Tortg. to S. W. Pass.	433
Total L'pool to S.W. Pass.	4566

Mercator:- From Dry Tortugas, Lat. 24° - 33′ N Long 83° - 00′ W
to Mobile Bay, Lat. 30° - 08′ N Long 88° - 04′ W
Course :- 321°(T) Distance 431 miles.

Abaco Lt. to Mobile Bay = 798 miles
Total L'pool to Mobile Bay = 4564 miles

Local Mean Time; Alabama & Louisiana :— G.M.T. Minus 6 hours.
B.S.T. Minus 7 hours.
(Summer Time G.M.T. - 5 hours B.S.T - 6 hours.)

VOYAGE NOTES:-

Vessel discharged grain cargo, pellets, rye, soya beans, & wheat at Liverpool & Birkenhead from 22nd Dec 70 to 26th Jan'71. Gyro compass was overhauled by Sperry engineer during vessels stay in port.

SAILED:- BIRKENHEAD, WED. 27TH JAN'71

DRAFT :- IN BALLAST — FOR'D 11'-10" AFT. 14'-09"

Pilot disembarked @ 1345 hrs. off Great Ormes Head. — engine adjustments were carried out till 1526 hr F.A.O.P. @ 1609 hrs. Pt. LYNAS, BRG 203° x 4' Clocks retarded 1 hour that night.

THURSDAY 28TH JAN'71. NOON:- 51°-15'N 9°-33'W. DIST 257'. SP. 12.2. SLIP 12.6% GYRO ERROR & LOW. OBS. Retarded clocks 1 hr. ϕ ERROR - 25'

FRIDAY, 29TH JAN'71 NOON:- 48°-43'N 15°-19'W DIST 270. SP. 10.8. SLIP 15.1% GYRO ERROR 1°N. OBS. NW 7/8 RGH SEA & HEAVY SWELL. ϕ ERROR -18'

SATURDAY, 30TH JAN'71 NOON:- 45°-39'N 21°-45'W. DIST 328. SP. 13.67. SLIP .06% GYRO ERROR 2½°H OBS NNW 7/8 RGH SEA & HEAVY SWELL. ϕ ERROR -51'. AV. REVS. 99. BOAT & FIRE DRILL 1615 hrs. Retarded clocks 1 hr. Reduced revs. for time due weather & manoeuvre stops to E/R requirements.

SUNDAY, 31ST JAN'71 NOON:- 43°-32'N 27°-55'W DIST 303. SP. 12.12 SLIP 10.4% GYRO ERR 2½°H OBS. NNW/W 6/7 RGH SEA & HEAVY SWELL ϕ ERR - 34'. AV REVS. 98.

MONDAY, 1ST FEB'71 NOON:- 42°-45'N 33°-25'W DIST 261. SP 10.87 SLIP% 15.8 GYRO 3°H OBS. NNW/6/7 ϕ ERROR -20' AV REVS. 93.6. RET. CLOCKS 1 HR.

TUESDAY, 2ND FEB'71 NOON:- 41°-04'N 40°-38'W DIST. 337. SP. 13.48 SLIP 5%, GYRO 1°N. OBS. W-SSW 4/6 RGH SEA & MOD SWELL. AV REVS. 102.8, ϕ ERR. -26'

40-38 N 64-00 W 15th - 68

WEDNESDAY 3RD FEB '71 Noon:- DR. 38°-05'N 45°-15'W Dist. 288, Sp. 12.00 Slip 12%, Gyro 1°N Allg. SSW-NNW 8/4 Mod Sea & M/H swell. Av. Revs. 99.6, ϕ Err. -25' Orders received proceed Mobile, Alla. for Soya bean meal. Y/c "Austurias" fano @ 1500 hrs.

THURSDAY 4TH FEB '71 Noon:- 35°-35'N 51°-01'W. Dist. 316, Sp. 13.17, C.M.G. 244½° Slip 1.2% Gyro 1°N Obs. N-NNW 5/7 Rgh Sea & Heavy Swell. Av. Revs. 96.6 ϕ Err -52 13.00 A/c to pass 15' south of Bermuda. Rain in afternoon; Ret. Clocks 1 hr.

MERCATOR:- Gibbs Hd. Bermuda. (325°x15') Lat. 32°-03'N Long 64°-40'W
Abaco Lt. Lat. 25°-46½'N Long 77°-10'W
Course:- 240°-16.5' Distance 759 miles.

DISTANCES
Gibbs Hd. To Abaco Lt.	=	759'
Abaco Lt. To Dry Tortugas	=	367'
Dry Tortg. To Mobile Bay	=	431'
Total Gibbs Hd. To Mobile	=	1,557'

FRIDAY 5TH FEB '71 Power failure at 0322 hrs. gyro stopped & steering sheet down. Restarted gyro - settled by 0800, obs. error 1½°H. Noon:- 33°-35'N 56°-44'W. Dist. 306, Sp 12.24. Slip 7%. NXW 5/6 Rough Sea & Heavy Swell; ϕ Err - 30'. Av. Revs. 95.4.

SATURDAY 6TH FEB '71. Noon:- 32°-26'N 63°-12'W Dist 335' Sp. 13.96 C.M.G. 254½°. Slip 2.6%; Gyro 1°N Err. WSW-SW 3/4 M/k. Sea & Mod Swell, Av Revs 103.8 Boat & Fire Drill 1615; Stacked. Boat swung out. 1810 Gibbs Hill bearing 006°x 19'. A/c 240° (G); Bermuda picked up on radar at 25': Retarded clocks 1 hour. Departure Pt. Bermuda. 32°-00'N 64°-46'W @ 1800, ϕ 2765' Dist. from Noon 84'. D.F. on Gibbs Hill was good, BDA-295.

SUNDAY 7TH FEB '71. Noon:- 29°-53'N 69-18'W Dist 351. Av Sp. 14.04. C.M.G. Vars. Slip 3.8%; Gyro 1°E. Av. Revs. 105.8, ϕ Err -56; Sargasso weed present. Crossing traffic in afternoon (tankers) from Mona passage.

MONDAY 8TH FEB '71. Noon:- 27°-13'N 74°-58'W Dist. 340. Av. Sp. 14.17 C.M.G. 242°. Slip 1.7% Gyro 1°H Av. Revs. 104½ ϕ Err - 54; Flying fish sighted. Landfall off south-eastern end of Great Abaco island on

the 2000-2400 watch in heavy rain & thunder squalls. Abaco light not sighted til 8' distant. D.F. station at Treasure Cay (ZTG-233) was fairly good. The land first showed on radar at 12½' but was difficult to identify. Vessel was 4' to the northward of course line. Wind in afternoon was SSW-6/7; 5° left leeway allowed since noon. Courses changed to pass up the centre of N.E. Providence Channel. Co. 286°(T) through N.W. Providence Channel to alteration point Great Isaac Lt. brg. 196°(T) x 14.7'. Distance Abaco Lt. to Gt. Isaac 108'; New course to Tarvey Rocks 234°(T), distance Gt. Isaac to Tarvey 67½'.
Considerable traffic in N.W. Providence Channel, particularly large passenger vessels rounding Gt. Stirrup Cay on their way to Nassau, New Providence. Wind fine of port bow & 5° right ~~leeway~~ set allowed, yet vessel set to the southward off Gt. Stirrup Cay. Stirrup Cay showed on radar at 20'.

TUESDAY 9TH FEB'71 Gt. Isaac Lt. Ho. appeared to be standing on legs & not perched on the rock as shown in the Pilot Book, West Indies III. page 120. NOON:- 25°-44'N 79°-53'W DIST. 304' AV. SP. 12.87, CO. VARS. SLIP 5.8%; GYRO 1°W. AV. REVS. 99; QMR -23. Courses changed, during daylight hours, from Tarvey Rocks southwards to pass 1½ TO 2 MILES off reefs; counter current of Gulf Stream of 1 to 2 knots experienced at times. Small pleasure craft in Florida Strait a menace. Clocks retarded 1 hour (the last hour).

WEDNESDAY 10TH FEB'71 Eclipse of moon sighted 00-04 watch this morning. NOON:- 26°-04'N 84°-21'W DIST. 326' AV. SP. 13.04 CO. VARS. SLIP 7.9%; GYRO ERR 1°W. NXW 6/7. Cloudy & clear. QMR -9, AV. REVS. 102 Considerable traffic off Dry Tortugas.

THURSDAY 11TH FEB'71 E.O.P. at 0848 hrs. Sand Lt. brg 326° x 6'; ½ was well ahead of ½. Av. Sp. since noon yesterday 14.95 knots. 3-hours, 30 mile pilotage up Mobile Bay. ½ berthed at Public Grain Elevator, Ala. State Docks, Mobile, Ala. at 1300 hrs. No cargo worked in the afternoon - surveyors on board. ½ tends to range when ship's

fans in the river – very poor lead on the sternlines as vessels' stern projects into river. Commenced loading soya bean meal Deep tanks & No 3 lower hold, Friday morning, able to work only two files at a time. Stopped at 0430 due to downpour – labour did not return that day. No cargo worked on Saturday or on Sunday. Draft on arrival (F) 8'-07" (A) 19'-06"
TOTAL DIST FOR PASSAGE:- 4638' T.S.T. 359·8 hrs T. Av. Sp. 12·89 Kts.

MERCATOR:- SEA BUOY, MOBILE BAY. LAT. 30°-08' N LONG. 88°-04' W
DRY TORTUGAS LAT. 24°-30' N LONG. 83°-00' W
COURSE:- 141°-14' DISTANCE:- 434 mls.

DRY TORTUGAS [by 029° x 9·0']
TO Co. 105° (T) DISTANCE. 60'
SAND KEY [015° x 13·5]
TO Co. 074° (T) DISTANCE. 80'
ALLIGATOR REEF. [ALLIGATOR 344° x 15·0']
TO Co. 046° (T) DISTANCE. 23'
MOLASSES REEF. [316° x 11·0']
TO Co. 036° (T) DISTANCE 93'
GT. ISAAC (1ST ALTERN.) [126° x 9·5']
TO Co. 068° (T) DISTANCE 10'
GT. ISAAC (2ND ALTERN.) [190° x 9·5']
TO Co. 104° (T) DISTANCE 107'
ABACO LT. [350° x 6·0']

MERCATOR:- GT. ABACO LT. LAT. 25°-46½' N LONG. 77°-10' W
15' NTH. CORVO. LAT. 39°-57' N LONG. 31°-17' W
COURSE:- 69°-48½' DISTANCE 2464½ mls.

CORVO. LAT. 39°-57' N LONG. 31°-17' W
CASQUETS. LAT. 49°-48' N LONG. 2-25' W
COURSE:- 64°-17·0' DISTANCE 1362 mls.

TOTAL DISTANCE BY ABOVE TWO RL. TRACKS. – 3826½ mls.

MERCATOR:- ABACO LT. LAT. 25°-46½' N LONG. 77°-10' W
CASQUETS. LAT. 49°-48' N LONG. 2°-25' W
COURSE:- 67°-37' DISTANCE 3786 miles.

CASQUETS [158° × 4·4']		
TO	Co. 072°	DIST 138'
BASSURELLE Y/Y/L. [342° × 4·0']		
TO	Co. 052°	DIST. 16·2'
RIJENS S.E. BUOY [350° × 3·5']		
TO	Co. 018°	DIST. 14·7'
COLBART N.E. BUOY [318° × 3·4']		
TO	Co. 046°	DIST. 20·8'
SANDETTIE S.W. BUOY [316° × 2·4']		
TO	Co. 057°	DIST. 13·7'
SANDETTIE LT./VL. [309° × 4·8']		
TO	Co. 010°	DIST. 12·3'
WEST HINDER [~~248°~~ 118° × 10·0']		
TO	Co. 038°	DIST. 17·2'
NOORD HINDER. [128° × 3·0']		
TO	Co 038°	DIST 104·5'
TEXEL LT. VL. [128° × 3·4']		
TO	Co. 038°	DIST. 29·4'
TERSCHELLINGERBANK LT./VL. [342° × 2·5']		
TO	Co. 072°	DIST. 60·0'
BORKUMRIFF LT/VL. [342° × 2·5']		
TO	Co. 080°	DIST. 45·2'
DB/J BUOY [170° × 1·0']		
TO	Co. 095°	DIST. 6·3'
WESER LT/VL. [185° × 0·6']		

DIST. CASQUETS TO WESER = 479'

MERCATOR:- MATANILLA SHOAL. LAT. 27°-28' N Lg. 79°-24' W
NORTH OF BERMUDA. LONG. 32°-33' N Lg. 65°-00' W.
COURSE:- 67°-54·8' DIST 811'

MERCATOR:- NORTH OF BERMUDA. LAT. 32°-33' N LONG. 65°-00' W
CASQUETS. LAT. 49°-48' N LONG. 2°-25' W
COURSE:- 69°-46·8' DIST. 2995'

TOT. DIST. BY ABOVE 2 RL. TRACKS = 3806'

MOLASSES REEF [3·6° × 11·0']
TO Co. 027° DIST. 41·3'
FOWEY RKS. [297° × 12·0']
TO Co. 007° DIST. 88'
JUPITER INLET [270° × 19·7']
TO Co. 032° DIST. 38·5'
MATANILLA SHOAL BUOY [120° × 13']

MERCATOR:- POSN:- OFF GIBBS HILL, BERMUDA LAT. 32°-11' N LONG. 64°-53' W
BETWEEN CORVO & FLORES LAT. 39°-36' N LONG. 31°-10' W
COURSE:- 74°-51·2' DIST:- 1703 mls.

CORVO & FLORES:- LAT. 39°-36' N LONG. 31°-10' W
CASQUETS:- LAT. 49-48' N LONG. 2°-25' W
COURSE:- 63°-27·8' DIST:- 1370 miles

TOT. DIST BY ABOVE 2 RL. TRACKS 3,073 mls.

FIVE ROUTES:—

1. DRY TORTUGAS; JUPITER INLET; 30° N 79° W; 35°-30' N 72-40 W; G.C. 42° N 50° W; C.C. BISHOP; BASSURELLE, 4218'
2. DRY TORTUGAS; JUPITER INLET; MATANILLA SH; BERMUDA; CASQUETS; BASSURELLE. 4275'
3. DRY TORTUGAS; JUPITER INLET; MATANILLA SH; BERMUDA; AZORES, CASQUETS; BASSURELLE. 4359'
4. DRY TORTUGAS; PROVIDENCE CH.; CASQUETS; BASSURELLE. 4297'
5. DRY TORTUGAS; PROVIDENCE CH; CORVO; CASQUETS, BASSURELLE. 4338'

YAGE NOTES :-

VOY No 50 EASTBOUND.

Completed loading cargo on Friday 19th Feb. '71. Sail from Mobile, Ala for Bremen, Germany at 1925 hrs. F.A.O.P. @ 2312 hrs. Seaway 006° x 1½'. Sailing Draft :- (F) 26'-00" (A) 30'-04" Density at Mobile 1000. Cargo: Soybean Mkl. New rotator fitted to log before sailing.

SATURDAY 20TH FEB '71 Noon :- 27°-52' 86°-03' W; Dist 173', Av. Sp 13.51, Av. Revs 101½ Slip 3.3%; Gyro Err 1°Lto1°H; 1615 Fire Drill. ΔErr. SSW to SxE; 4/5, Cloudy & clear. Slt/Mud Sea & Low Swell.

SUNDAY 21ST FEB '71 0530 A/c @ Dry Tortugas; Very Heavy Traffic off Tortugas. NWly set experienced between Key West & Alligator Reef. Full force of the Gulf Stream not really felt until ½- rounded Alligator Reef. ΔErr Noon :- 24°-15' N [redacted] W Av. Sp. 13.62; Dist. 327 Av. Revs 102.7 Slip 3.8%; Gyro Err. Nil; Small pleasure craft not encountered in Florida Strait unlike inbound passage. SSE to SExS 3/4; Cloudy & Clear; Mod Sea & Low Swell; Clocks advanced 1 hr.

MONDAY 22ND FEB '71 Note on chart warns that current may set on to Matanilla Shoal. Noon :- 28°-07' N 77°-40 W Dist. 362. Av. Sp. 15.74. Av. Revs. 103.8 Slip -10%; Gyro Err ½°H; Δ -73. Gulf weed present. E to SSE 3/5 Cloudy & clear, Mod. Sea; Low Swell. Dubious readings from E/R sea temp. Average Sea temp. this area, Feb. 20°C (68°F)

TUESDAY 23RD FEB '71 Noon: 30°-18' N 71°-30' W Dist 350; Av. Sp 14.58; Av Revs 104.6 Slip 1.0%; Gyro Err - Nil; ΔErr -43. Alone Gulf weed. Inna fisherman encountered with numerous buoys. SSE 3/4 Cloudy & clear; Mod Sea & Low Swell.

WEDNESDAY 24TH FEB '71 Noon: 32°-08 N 65°-11 W Dist 344; Av Sp 14.33; Av Revs 105.1 Slip 1.1%; Gyro Err - Nil; ΔErr. -30; 0330 Heavy rain shower; VSW 4/6; Rough Sea. Mod. Swell; Cloudy. Western end of Bermuda showed on radar at about 35 miles. 1105 Isaac tower, Plantagenet Bank bore 138° x 15'. Challenger Bank Lt. float was not sighted, should have been 3' on the port beam at 12°° hrs. Passed 3½' south of Gibbs Hill at 1315 hrs. Lt. house (white tower) on Gibbs Hill very prominent; large building under construction on hill-top to the east of Gibbs Hill, (probably a hotel) should be conspicuous when completed. St. Davids not so conspic. (white tower, red band). Flying fish & Sargasso weed present. Buoy (adrift - depth 2600 fms) sighted on 20°° to 24°° watch (Fl. 20sec. Approx.). Clocks advanced 1 hr.

THURSDAY 25TH FEB 71 Noon:- 33°-17'N 54°-06'W Dist. 316, Av.Sp 13·74, ΔErr -13. Gyro-Mil. Av. Revs. 104·6 Slip 5% Sights indicate set to the southward, Pilot Chart for February gives 0·4 knots SSE. W'ly to NNW 4/7. Rough Sea, max/Heavy swell.

FRIDAY 26TH FEB '71 No sights this morning, rain, thunder & lightening at a distance. D.R. 12hrs 35°-06'N 53°-00'W; Dist. 324' Av.Sp 13·50. Av. Revs. 105·7 Slip 7.4%. WNW to SW 4/6 Rough sea & heavy swell, o'cast, RAIN AT TIMES. Clocks advanced 1 hr.

SATURDAY 27TH FEB '71 Noon:- 36°-37'N 46°-24'W Dist. 335, Av.Sp 14·56, Gyro Mil-1°Var. ΔEr -34; Av. Revs 105. Slip -0.6% SWxS to WxS 4/6 Rough Sea & heavy swell, Mainly o'cast Rain at times. 1615 Boat drill. C.M.G. 074°

SUNDAY 28TH FEB '71 Noon:- 38°-44'N 40°-30'W Dist. 309' Av.Sp 12·87. C.M.G. 065¾. Gyro-Mil; ΔEr. -22 NW to NExN 7/8 V. Rough & Heavy Swell; Mainly heavily o'cast. rain - heavy at times; Deck hatches awash. Av. Revs 102; Slip 8·6% Clocks advanced 1 hr.

MONDAY 1ST MAR '71 No sights this morning, Lat. at noon. D.R. Noon:- 40°-38'N 34°-49'N Dist. 288 miles, Sp. 12 knots. Wind NExN force 7 in early morning. Shipping heavy seas on deck & over hatches, frequent rain showers, wind backed to force 2 in afternoon, then shifted SSE & freshened again, rain cleared. 1013 Secs: Incr:- Poem of "Swift Pafter" @ Noon 41°-55'N 27°-27'W Co. 233, Sp. 15 kts to Cork & New Orleans. Wrote: Capt. Gleeson, 2/c Garvey, 3/c Kavanagh, 3/c Richardson; 2/c Cunningham, 2/c Webster, 3/c Morgan, 2/c Dillon. Thirteen regard wreaks Dover Straits, "Tobacco Carribean" "Brandenburg" & "Tiki" received 1745 G.M.T. Nos 067/71. Av. Revs. 101·3 Slip 10%

TUESDAY 2ND MAR '71 Noon:- 42°-45'N 28°-36'W Dist. 307, Av.Sp. 12·77, C.M.G. 065½° Av. Revs. 104·6, Slip. 11·27% SExS to SSE 4/6 Rough sea & Heavy/Mod Swell. O'cast & clear. Shipping spray on deck & over hatches.

WEDNESDAY 3RD MAR '71 Noon: 44°-5'N 21°-22'W Dist. 338, Sp 14·08 kts. C.M.G. 068° ΔErr - 32; Gyro Err Nil; Av. Revs. 105·2, Slip. 2·9%; SSE 4/5; Rough Sea, Mod Swell, O'cast & Clear. Encountered Spanish Naval vessels (3rd maybe more) from Cadiz on 00-04 watch this morning. Helicopter or other U.F.O. sighted on 20-24 watch. Clocks advanced 1 hr.

~~4~~ 5TH MAR '71 Noon:- 46°-52'N 14°-12'W. Dist. 323; Av.Sp. 14.04. Av.Revs. 106.2, Slip 3½% 22-34; Gyro. Nil; SSE→SE 4; Mod Sea & Swell. Overcast & Clear. First sea bird sighted today (greater black-backed gull). Some traffic met with during the day. Clocks advanced 1 hour.

FRIDAY 5TH MAR '71 Decca refused to ZERO in the morning; D.F. of Helmut (308-CA) very poor at night. Echo sounder gone crazy. D.F.'s were good at daybreak & thereafter, Helmut (308-CA); Round Island (308-RR) Noon:- By sights & D.F. 48°-45'N. 6°-57' W. Dist. 317, Av.Sp. 13.78, C.M.G. 067½°. Av.Revs. 105.4 Slip 5.6%. 4 ERR-53. Gyro-Nil. SE to ESE 3/7 Rough Sea & mod swell. Ocast & clear; First fix by Decca (1B/MP-S.V. BRITISH) @ 14.00 Lat 49°-04'4. 6°-14'W. (Bassurelle L.V. ahead @ 1220 on 6TH) Clocks advanced 1 h.

SATURDAY 6TH MAR '71 Off Casquets at 0230 this morning; vis not too good at times; traffic heavy; a few ship at work encountered at 01.00 approx. in position Casquets bng 110° x 15' Decca not zero-ing well on English chain (5B/MP); changed to S.W. British chain (1B/MP) with better results; plenty of fishermen. Noon:- 50°-29'N 0°-52'E. Dist. 318 Av.Sp. 13.83 Av.Revs. 106, Slip 5.6% ESE to NE by E 4/5; Mod Sea & Low Swell. Snow showers in the morning; wind reached force 10, NE by N for a time on 08-12 watch, weather cleared in afternoon for passage through Dover Strait; average vis. 5-6 miles. Bassurelle L.V. ahead @ 1220 hrs. Traffic in Dover Strait was light & orderly by Strait standards. One British Rail ferry & one hovercraft encountered crossing off Cap Gris Nez. Racon on Bassurelle lt.vl. not observed. Decca seems to have steadied up at last. 1840 hrs. West Hinder lt.vl. bng 114°x 10' A/c 027° to pass north of Brown Ridge; Dist. West Hinder to Brown Ridge 89', Dist. Brown Ridge to Terschellingerbank lt.vl. 70', Co. 052°(TS).

SUNDAY 7TH MAR '71 A/c off north end of Brown Ridge, using Decca fix & D.F.'s of Terschellingerbank lt.vl. (TG - 308) & Texel lt.vl. (HK - 308). D.F.'s were good & clear. Traffic was light except for many fishermen; vis. good & clear. 0' TERSCHELLINGERBANK abeam 0525; BORKUMRIFF abm. 0945. Noon:- 53°-51'N 7°-14'E Dist 332 Av.Sp. 13.83; Av.Revs. 105.6; Slip 5.1% NE to N 4/2 Sm Sea & Low Swell. Misty & Ocast. E.C.P. @ 1318 hrs. WESER lt.vl. bng 106° x 3.75'.

1402 hrs. anchored in position Weser Lt.Vl. bng 312°(T) x 0.[illegible]; port & 4 shackles in water. Weser pilot vessel "GOTTHILF HAG[illegible]" carries on station about ½ mile north of lightship, calls on Ch. 16 VH.F. & works Ch. 6.; black hull, white supers., buff funnel; name "LOTSE" in white on sides. Large suction dredger constantly working in entrance to Wangerooger Fahrwasser. Large tankers may be found at anchor about 3 miles NW of Weser Lt.vl.

SUNDAY 9TH MAR.'71. Rec. Drake at 2254 hrs., F.W.E. 2321. Draft in on the river & the ebb is particularly strong; Draft aer. (F) 26-07" (A) 28-00". Three smokers working & barges alongside. Pilots change at Bremerhaven. Weser to Bremerhaven 1½ hrs. APPROX.; Bremerhaven to Drake 1½ hrs. approx. Moved up river to Bremen of Friday 12th Mar.'71.

SATURDAY 13TH MAR.'71. & subsequently. M.V. "IRISH SYCAMORE" V69 51.

Shore cleaners worked at Bremen ob Sat. & Sun. - no cargo worked; ½/c commenced shorter to HANSA LINE. Loading in Bremen, Hamburg, Antwerp, Dotlek & Rotterdam & proceeding direct to Muscat & thence to Dubai Doha, Bahrein, Dammam, Kuwait & Abadan. NOTE:- no bunkering stp on the way; capacity bunkers to be shifted at Rotterdam; no F.W. is available in the Persian Gulf. Cargo; Machinery, heavy lifts, steel billets, pipes, land-rovers, cars, caravans, cement, "ghee" animal fat, cans milk, beer, soft drinks, spirits, crane parts, crates of mach. parts, cigarettes & generals. ~~Funnel~~ painted in "Hansa" colours. Large rise & fall of tide at Bremen, loading by shore cranes, & heavy lifts by floating crane. On passage to Hamburg, Weser pilot disembs at Cuxhaven & Elbe pilot boards. Docked @ ODERHAFEN in Hamburg; ships lines used for the tugs; Green light required over sternlight on the Elbe. Docked at berth 247 in Antwerp; ships lines for tugs; floating crane & barges worked alongside. Entrance through OOSTGAT (RESTRICTED DRAFT 24 FEET) Pilot boards off MZ Buoy. Dutch pilot vessel on station, black hull, black funnel, white uppers, blue flag at masthead with white "L". If draft exceeds 24 ft. entry must be made through "Vlieling" pilot vessel stationed off "A1" Buoy. Pilot for Rotterdam & Dotlek board off MAAS Buoy. Loaded "smokes" at Dotlek; berth a bit on the

REM. TO HAMBURG:-

BREMEN TO WESER LT. VL. 66 miles (WESER LT. VL. BRG: 180°(T) x ½')
WESER LT. VL. TO ELBE I LT. VL. 14 miles. COURSE. 056°(T)
ELBE I TO HAMBURG 78 miles.
TOTAL DISTANCE BREMEN TO HAMBURG 158 miles.

MBURG TO ANTWERP.

HAMBURG TO ELBE I LT. VL (BRG 180° x ½')	Co. VARS.	DIST. 78	MILES.
ELBE I TO TW/E BUOY (350° x 1.3')	Co. 260°	DIST. 17	—"—
TW/E BUOY TO BORKUMRIFF LT. VL. (17½° x 2.5')	Co. 260°	DIST. 45½	"
BORKUMRIFF LT VL. TO TERSCHELLINGERGRUND (162° x 2.3')	Co. 252°	DIST. 60	"
TERSCHELLINGERBANK TO TEXEL LT. VL. (117° x 1.5')	Co. 208°	DIST. 33	"
TEXEL TO EURO I BUOY (117° x ½')	Co. 207°	DIST. 71	"
EURO I BUOY TO SD BUOY (111° x ½')	Co. 201°	DIST. 17	"
SD BUOY TO PILOT (OFF MZ BUOY)	Co. 175°	DIST. 1½	"
MZ BUOY TO FLUSHING	VARS.	DIST. 20	"
FLUSHING TO ANTWERP.	VARS.	DIST. 48	"
TOTAL DIST. HAMBURG TO ANTWERP.		391	"
TOTAL DIST. PILOT TO PILOT.		245	"

NTWERP TO ROTTERDAM:-

ANTWERP TO FLUSHING	Co VAR.	DIST. 48	"
FLUSHING TO MZ BUOY	Co. VAR.	DIST. 20	"
MSB BUOY [1' NORTH OF.] TO MAAS BUOY	Co 044°	DIST. 30	"
MAAS BUOY TO ROTTERDAM.	Co. VARS.	DIST. 25	"
MAAS BUOY TO BOTLEK	Co. VARS.	DIST. 18	"

ROTTERDAM TO MUSCAT v/a DURBAN.

MARS BUOY TO NOORD HINDER LT.VL. [158° x 2·7']	Co. 249°	DIST. 54½	MILES
N. HINDER LT. VL. TO S. FLS. B[illegible] LT. FIX. FL. [340° x 1·6']	Co. 225°	DIST. 41	"
S. FALLS BUOY TO VARNE LT. VL. [095° x 2·5']	Co. 235°	DIST. 14	"
VARNE LT. VL. TO DUNGENESS [313° x 5·3']	Co. 223°	DIST. 14	"
DUNGENESS TO ROYAL SOVEREIGN [324° x 7·5']	Co. 234°	DIST. 24½	"
ROYAL SOVEREIGN TO CASQUETS [159° x 9·5']	Co. 249°	DIST. 125	"
CASQUETS TO USHANT [146° x 12·0']	Co. 236°	DIST. 134	"
USHANT TO (Tarifana) CABO VILLANO [118° x 12·0'] LAT 43°-07' 9°-33'W	Co. 208°	DIST. 374	"
TORRIANA TO GRAN CANARIA (27°-51'N 15°-19'W)	Co. 197°	DIST 959	"
GRAN CANARIA TO CAPE BARBAS (22°-10'N 17-34'W)	Co. 199°-50'	DIST 363	"
C. BARBAS TO CABO VERT. (14°-48'N 18°-00'W)	Co. 183°-12'	DIST. 443	"
C. VERT TO POSN. (10°-40'N 17°-40'W)	Co. 184°-32'	DIST. 249'	"
POSN. TO CAPE GOOD HOPE (34°-26'S 18°-09'E)	Co. 142°-47'	DIST. 3398½	"
C. GOOD HOPE TO CAPE AGULHAS	Co. 116°	DIST. 75½	"
AGULHAS PT. TO CAPE ST. FRANCIS	Co. 105°	DIST 25	"
C. AGULHAS TO C. ST. FRANCIS	Co. 081°	DIST. 246	"
C. ST. FRANCIS TO C. RECIFFE	Co. 079°	DIST. 47	"
C. RECIFFE TO GT. FISH PT.	Co. 068°	DIST. 83	"
GT. FISH PT. TO BUFFALO PT.	Co. 051°	DIST. 48	"
BUFFALO TO BANKSIDE PT.	Co. 042°	DIST. 73	"
BANKSIDE TO 5TH SAND BLUFF.	Co. 044°	DIST. 80	"
5TH S. BLUFF TO COOPER PT (DURBAN) LAT. 29°-34'-31-25'E.	Co. 038°	DIST. 105	"
COOPER PT. TO POINT. LAT. 27°-15'S LONG 36-00'E (MOCZ. CHAN.)	Co. 054°-10'	DIST. 299	"
MOCZ CH. TO JUAN NOVA (17°-00'S 42°-15'E)	Co. 029°-23'	DIST. 707	"
J. NOVA TO ILES COMORES (11°-35'S 42°-50'E)	Co. 005°-52'	DIST. ~~1099~~ 327	"
I. COMORES TO SOCRATA (12°-35'N 55°-20'E)	Co. 027°-20'	DIST. 1633	"
SOCRATA TO RAS-AL-HADD (22°-30'N 60°-05'E)	Co. 335°-21'	DIST. 665	"
RAS-AL-HADD TO MUSCAT.	Co.	DIST. 107	"

TOTAL DIST ROTTERDAM TO MUSCAT 10,737

" DURBAN TO MUSCAT. 3,720

short side, poor load for the liners. Berthed in WAALHAVEN in Rotterdam; articles changed in Rotterdam 27 March '71. ½ expected to sail from Rotterdam for Muscat on 28th March '71. Hours worked by longshoremen in the European ports varied greatly, night gangs worked sometimes. The ship's office was in constant use by tally clerks.

S.S. "IRISH SPRUCE" Voyage No. 84 4/28

COURSE TOWARDS ST. LAWRENCE IN BALLAST.

ROCHES PT. TO DAUNT 4/v	Co.	DIST.
DAUNT 4/v TO OLD HEAD KINSALE	Co.	DIST.
OLD HD KINSALE TO FASTNET	Co.	DIST.
FASTNET TO CAPE BAULD (LAT LONG)	Co.	DIST. RHUMB LINE.
CAPE BAULD [BRG ° X MLS]		MILES.

CAPE BAULD TO

S. "IRISH SPRUCE"

Joined ½c at Pembroke dockyard on Thursday 10th July JUNE 1941; One year articles opened that afternoon:- Master J.H. Evans; ½c R. Tiddler; 3c H. Courtney; J. Morgan ½c L. Bridge ½c; C.P. Kelly ½c; D. Geary ½c; W. Rogers ½c; L. Fanning ½c; W. Kelly & Coleman ½c. ½ acres in drydock from 27th May '41 to 13th June 41. Large gat done on the rudder bye, spare anchor & port anchor interchanged, new radar "RADARCIA" fitted; L.S.A. survey done.

14th JUNE '41 Dockyard took less than an hour to flood, ½c afloat at 2020 & then warped out to buoy by ship's forecastle (astern to dolphin) Long stern lines to the shore needed because of strong ebb. When starting up Gyro A.C. Volts would not come above 20 volts (Normal working voltage 50 V.); fault in A/DC converter motor, lucky gat on the job, 500 rounds 4" AMMO; 4 drums loaded.

15th JUNE '41 Let go at 0345; Tug "Shandon" & "Anacreia"; pilot W. Leahy. Full Away & 0500 off Rocket Pt. Racon on Diamond ½ showing on radar; Gyro checked on leading lights, ½-1° high. 0420 Diamond ½ bng 262°(T) x 0·4 mls. ½c 229°(T); 0515 Old Hd. of Kinsale bng 310°(T) x 2·2 mls ½c 230°(T) 08th Fastnet ½ bng 322°(T) x 4·2 mls. ½c 271°(T); Decca working good. Noon:- 51-20 N 1°-0'W Dist 115 mls. S.Sp. 14·38 kts. Co 218° S.T. 8·0 hrs, Sig 15 A.C. 8·0; D.C. 0·8 Clocks 1 hr + 2 - Gen. Visc. 1½ 3½ Cent. & clear. Clocks retarded 1 hour tonight. Draught ashore Cable 1st 0'-0" (A) 16'-0"

16th JUNE '41 Noon:- 50°-0 N 2°-45 W Co 2°T Dist 115 mls, S.T. 8 hrs. Dist 115 mls A.C. 35·6, D.C. 0·0, Ship's time ½ hr fast (Routine Security & 1st watch set) Overcast & clear. Time G.M.T. 4 - Clocks - 4 hrs. T.S. 32 hrs. T.D. 52 mls. T.A.S. 15·7 kts. Clocks retarded 4 hours.

17th JUNE '41 Visibility fresh hours from 0330 to 1545; Noon. 51-18 N 32°-43 W S.T. 25 hrs. Dist. 4 mls. A.S. 16·56. To Go 133°; Co 2°T 23°; 4-16, -3·86% T.S.T. 58 hrs. T.D. 960 mls; T.A.S. 16·11, H.C. 36·6; D.C. 0·6 TS. Time 1 hr - G.M.T. 16/5 to 20th C Wave was of calibre. Time & Boat Drill this afternoon. Wind S; - S'ly 4 Cloudy/Clear. Rolling Pitching easily; Southerly wind brought fog Clocks retarded 1 hour.

18th JUNE '41 Noon:- 51°-33'N 43°-13'W; S.T. 25 hrs. Dist. 3¾ mls. Av. Sp. 15·76 knots. To Go 98°; Co 2°T (+) 4° = 21 mls - 5·33% T.S.T. 83 hrs. T.D. 1328' T.A.S. 16·00; H.C. 33·8 D.C. 1·2 TS. Time 2 hrs - G.M.T. Clocks advanced 1 hour.

18th June '71 Noon :- 51°-42'N 53°-48'W; S.T. 25 hrs. A. Sp. 345 Dist 15.80 knots. Togo 586; Co 271° & -13-3.28% T.S.T 10 hrs. T Dist. 1723; T.A.S. 1844; T.A.S 15.94. H.O. 3.7, D.C. 1.0 knots. 5/8 2/3 Thinly overcast. Ice was first encountered approx 12 hrs. before arriving off Belle Isle. 120° S.S.E. in ice two bergs passed in the morning were 105 ft & 160 ft high. The sea temp. dropped sharply to 3.2° c in the morning. The sharp angular bergs showed up well on the radar, but the old bergs that had melted and had smooth rounded-off edges were very poor targets. 1510 Cape Bonavista 7m. bg 213°(T) x 8' A/c 261°(T) 1640 Cape Norman abeam 2' A/c 234°(T) 1845 Flower Pt (Flowers Pt.) abeam 4.4' A/c 236°(T) Clocks retarded 1 hour.

19th June '71 Noon :- 50-00'N 63°-18'W; S.T. 25 hrs. Dist. 394, A. Sp. 15.76 kts. Togo 265 (% diverted to Quebec) to Escoumain Pilot Station. 4-23 - 5.84% 133 hrs. 2117 nms. T.A.S. 15.92 kts. H.O. 33.2 D.C. 1.1; Time 4 hrs - G.M.T. 1514 West Pt 4/10 abeam bg 187°(T) x 7.9' A/c 243°(T); 0415 hrs Cormorant Rks bg 348° x 10.2' A/c 270°(T) The average run. was about 4' during the day. The first "reporting in" call was made at about 1000 of Seven Isles.

St Lawrence River - V.H.F. Marine Safety Traffic Control System.
Westbound vessels report in when south of Sept. Isles on Ch. 14, V.H.F., he answers to the name "Channel Quebec" & will want to know call letters net tonnage, deepest draft, dangerous cargo if any, port to which bound, present position in Lat. & Long, Course & speed, E.T.A. next reporting point & God knows what else.

1. Sept Isles Ch 14.
2. Pointe des Monts Ch 14.
3. Manicouagan Pt. Ch. 14.
4. Pointe à Michel Ch 14.
5. Pointe au Boisvert. Ch. 14/12.
6. Escoumins (St. Lawrence Pilots) Ch. 12/16.

E.T.A. Escoumins must be given to "Channel Quebec" three (3) hours beforehand.

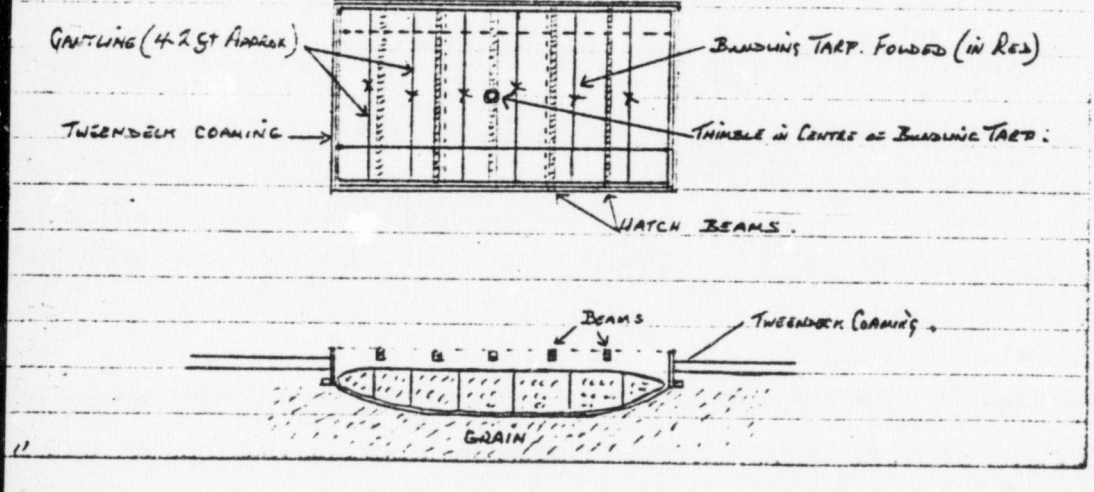
1st June 71 0436 E.O.T. 5¾ ENE Escoumains Pilot Station; S.T. 16·6 L. Dist 265 mls. Av. Sp. 15·4; T.S.T. 14h·6 hrs. T. Dist. 2382 mls. T.A.S. 15·2; H.O. 21·1; D.O.C 9. Vis. was clear to 1' off Escoumains Pnt. N. Lachance 1510 Let go Port anchor. 1530 Brought up at 7½ fathoms at anchorage south of Quebec. 2050 Severe thunder squall; Wind gusting S.W. 9; 2101 Port anchor dragging, let go starboard anchor. 2105 ½ Dragging anchor; Slow Ahd. 2107 squall passed; commenced heaving up. 2114 Broke anchor; 2200 Anchored again Let ½ was to near the fairway. 2222 Commenced heaving up & weighed & anchored & 2320, using the starboard anchor 6 Cbs on deck. 2325 Pilot boards & verified ship's position.

2nd June 71 ½ lying at anchor in Quebec Hr. Customs & other officials were on board in the afternoon - berth not yet available. The set at the anchorage was particularly strong.

2nd June 71 Berthed Qu Quebec. Pilot:- J.P. Ouellet. Tugs:- "Tamisy" & "Jerry C". Hove up at 1439; Port side to. F.W.E. & 1557. Commenced loading deep tanks, No's 4 & 5 @ 1610 hrs - unable to work the fore hatches due to short length of travel of loading gantries, worked up until midnight.

3rd June 71 0740 to 0820 Shifted astern ½ ships length, to load No 3 hold, unable to get to work No 1 — large Soviet bulk carrier also on the berth. Shifted again at 1040 hrs — 10 ft astern. Finished loading cargo @ 2115 hrs.

"BUNDLING IN BULK."



Pilot:- R. Thezeze. 2157 Singled up awaiting tugs "Robert B No 1" & "Jerry C" 2307 hrs let go. 2312 Swinging in basin. 2330 Proceeding downriver.

Thurs. 24th June 71 0733 Pilot away at Escoumins; 0742 F.A.O.T. 1015 hrs Father Point. Noon:- 48°-53'N 67°-54'W Co Vars. Dist. 69 Av Sp 16.05 kts. W'ly 2/3 Rain at times, Vis not too good 20-24 hrs total. Clocks advanced 1 hour.

Fri. 25th June '71. 0950 Whittle Pt. Noon 50°-19'N 59°-14'W; 23 hrs. Dist. 358' Av Sp. 15.56 Co Vars. W'ly 3 O'cast; Red. Vis. at times. 1937 Ryan Pt. 2.55 Cape Norman. Clocks advance 1 hr. 2255 Slow ahead - icebergs - shelf ahead in sea temp.

Sat 26th June '71. Numerous barges, growlers & fishermen in the morning, poor vis. at times. Noon 52°-52'N 52°-25'W Dist. 273 Av Sp 11.87 Dont & time Draft.

Sun 27th June '71. Noon 55°-05'N 42°-44'W Dist 367 Av Sp. 15.29; Mod Sea & swell Cloudy & clear; Rolling & pitching easily. Clocks advanced 30 mins.

Mon. 28th June '71 Noon 56°-07'N 32°-19'W 359' Av Sp 15.28. Rolling mostly and Pitching heavily to heavy NE'ly swell; heavily o'cast & clear. Clocks advs. 30 m.

Tues. 29th June '71 Noon 56°-28'N 21°-59'W 345' Av. Sp. 14.68; Mainly o'cast & clear; rain showers at times; Roll & Pitch mostly; Clocks advs. 1 hour.

Wed 30th June '71. Noon 55°-51'N 11°-09'W 365' Av. Sp 15.87 O'cast; Poor Vis at times. 2030 Inishtrahull 7m by 108° x 17.7'. Racon m. Inishtrahull working well. Clocks advs. 1 hr. 00

Thurs 1st July '71 0030 Pittochelly 4/m by 221(T) x 2.7 miles. 0320 Howth by 229(T) x 11.3' 0635 Coilagh Pt. by 058(T) x 8.75' 1042 E.C.P. Bar 4/m by 180°T x 3½ miles. Total Dist 2460 miles; Total St. Time 166 hrs. Total Av Speed 14.82 knots. 1125 P.C.B. Mersey Fairway. 1145 Formby 7m. 1207 Crosby 7/m 1252 Let go stbd anchor. 1653, Commenced Hauling Astern; SBC., Tugs "Hilary", "Cuillin", & "North Esk" in attendance. 1732 ½ entering basin 1800 All fast in Basin - Awaiting correct water level. 1952 Proceeding. 1955 Clear Basin, 2000 Appr. Berth. 2010 Alongside Berth. 2016 All fast F&A; F.W.E. Vessel berthed starboard side to at Rank's Silo, East Tower, East Float, Birkenhead.

S.S. IRISH SPRUCE — VOY 85

LIVERPOOL TO PANAMA CANAL.

LIVERPOOL BAR L/V. TO SKERRIES (155 x 9')	Co. 271	DIST. 49
SKERRIES TO TUSKAR RK. (302 x 3')	Co. 212	DIST. 98
TUSKAR TO AZORES (39°-01'N 30°-00'W)	Co. 232	DIST. 1274
AZORES TO MONA PASSAGE (MONITOR Is. 148° x 3')	Co. 238	DIST. 2349
MONA PASSAGE TO FARALLON SUCIO (143 x 3')	Co. 233	DIST. 859
FAR. SUCIO TO CRISTOBAL BREAKWATER.	Co. 221	DIST. 23

THENCE 180° THROUGH THE BREAKWATER HEADS.

TOTAL DIST. L'POOL BAR TO TUSKAR.	147
TOTAL DIST. L'POOL BAR TO CRISTOBAL, BY A.	4,652
4. TOTAL DIST. TUSKAR TO MONA PS. VIA (39°-00'N 40°-00'W) RHUMB LINES	3,623
B. TOTAL DIST. TUSKAR TO MONA PS. SINGLE RHUMB LINE.	3,689
GT. CIRCLE FASTNET TO MONA.	3379
TUSKAR TO FASTNET	139
C TUSKAR TO MONA VIA GT. CIRCLE FROM FASTNET.	3,518
MONA PS TO CRISTOBAL.	882
DIFFERENCE A—B.	34
DIFFERENCE B - C.	71
DIFFERENCE A - C.	105
FASTNET TO MONA — RHUMB LINE	3,442
D TUSKAR TO FASTNET RHUMB LINE TO MONA PASS. (DIFFERENCE B - D = 8')	3,581.

POSITIONS:-

TUSKAR RK.	LAT. 52°-10'N	LONG. 6°-07'W
FASTNET RK.	LAT. 51°-21'N	LONG. 9°-34'W
AZORES BETWEEN CERVOD FIAL	LAT. 39°-00'N	LONG. 30°-00'W
MONA PASSAGE.	LAT. 18°-12'N	LONG. 67°-59'W
FARALLON SUCIO.	LAT. 9°-44'N	LONG. 79°-44'W

DIVERTION:- 20TH July '71 TO SAN JUAN PUERTO RICO.

SAN JUAN (PUNTA DEL MORRO 180° x 2') TO BORINQUEN PT.	Co. 274°	DIST.	58.5'
BORINQUEN PT. (LIGHT BRG. 004°T x 4') TO MONA Is. 321°x3'	Co. 231°	DIST.	49.5'
MONA Is. TO FARALLON SUCIO TO CRISTOBAL.	Co. 234°-221°	DIST.	882.0
DIST. SAN JUAN TO MONA = 108'	DIST. SAN JUAN TO CRISTOBAL		990.0

STEAMING TIME AT 16 KNOTS. = 2 DAYS 13 HOURS 54 MINS. AT 16½ KTS. = 2 DAYS 12 HRS.

TIME DIFFERENCE SAN JUAN (GMT-4) & PANAMA (GMT-5) = 1 HOUR.

S. IRISH SPRUCE — VOY. 85.

LIVERPOOL TO ECUADOR & PERU · VIA PANAMA CANAL.

Wed. 7th July 71 & Subs. Completed discharge of grain cargo at Birkenhead at 1350 hrs. 7th July. Left berth @ 2000 hrs. Pilot - Mr. Jewells; Tugs: (F) WADDING, (A) NORTH LOCK, (M) NORTH LIGHT. 2025 ½ fast in lock 2050 ½ leaving lock & entering river. 2135 ½ entering Langton Lock. 2209 Leaving Langton Lock; 2220 ½ in Brocklebank dock; 2242 F.W.E. ½ at Canada Dock, Mid-West. ½ commenced charter to C.P.V. Peruvian Lines. Loading commenced 0800, 8th July. Hours worked, 08°° to 19°° weekdays; 08°° to 17°° Friday; no work Sat. or Sun. Cargo general:- Bags malt, cars, tractors in cases, one heavy lift (Asphalt Machine - 10 tons) Jumbo reel; Bailey bridges, tyres; china clay, sodium carbonate in bags, cases machinery parts; chemicals in metal drums; whiskey, gin, specials, reg. & unregistered mail, mining equipment, chemicals stowed in No 4 reefers (to be kept cool), drums on deck, canned milk. Rotation of ports:- Guayaquil, Chimbote, Callao & Matarani. Agents at Liverpool Mr. Leech & Mr. Jones; Stevedore Mr. Fisher.

Thur. 13th July 71 Completed loading cargo 19°° hrs., approx 20 tons of cargo left & to be loaded @ 1900 hrs. vessel sailed without this cargo. 2215; Pilot - Mr. Rosser, Tugs "FILEGARTH" "MAPLEGARTH" "HAZELGARTH" singling up. F.W.A; accommodation ladder swung in because of considerable fall in dock. 2310 ½ let go from dock; 2340 ½ after Langton Lock. 2350 ½ in Langton Lock.

Wed. 14th July 71 0033 ½ clear of Langton Lock & swinging in river. 0109 Crosby ½ abeam; 0129 Formby abeam; 0149 Bar ½ abeam x ½'. 0220 N.W. Float abeam x 1'. 0346 Approaching pilot cutter off Pt. Lynas 0400 Pilot away. 0406 F.A.C.T. Pt Lynas 255(TS) x 5'. Noon. 52°-03' N 6°-26' W Co Vars. Dist 135; St. Fire 7.9 hrs. Avg Sf 17.09 kts. Ave Revs 95.0; Slip Negative; HO. 10.0 ts.; DO. 04 ts; Wind NW-NE 4/5 Ocast & clear. Bar 1030.2; Temp 14.5°(C); Dist. to go 4491 miles. Numerous fishermen encountered off Conigheg ½ & southwards; B+I "Innisfallen" sighted on her way to Swansea; drilling ship "OCEAN NORTH SEA" with helicopters & attendant ship "SMIT LLOYD"

also sighted. Clocks retarded 1 hour. Radar & Decca worked well on coast

Thurs. 15th July 71.

Numerous fishing vessels encountered on the 100 fms. (200 m) line; soundings were not very abrupt and were thus not of great value.

Noon:- 47°-50'N 14°-40'W Co. 23½, Dist 406, S.T. 25 hrs. Av.Sp. 16.24, Revs 101.3 H.C. 37.0; D.O. 1.1; Slip 1.45%, Dist x Eng 412'; Wind W-NE 3/4 Overcast & clear. ⊕ Err -28' (-6.84%) T.S.T. 32.9 hrs. T. Dis. 541'; T.A.S. 16.44 kts. Clocks-G.M.T. Baro 1027.2. Temp 25°c. Hygro ½° Low. ½ Rolling & pitching easily to following sea & swell; Sea temp 17°c. Dist. to go. 4085; Clocks retarded 1 hour.

Fri 16th July 71.

Noon:- 43°-33'N 22°-15'W Co. 231° Dist. 409, St. Time 25 hrs. Av. Sp 16.36, Revs 14.5 H.C. 37.8, D.C. 1.1. Slip 0.72%, Dist x Eng 412'; Wind NE 3/4; Mainly overcast & clear. ⊕ Err -27' (-6.60%) T.S.T. 57.9 hrs. T. Dist 950; T.A.S. 16.40 kts. Clocks 1h-GMT. Dist. to go. 3676' Baro 1023.3. Temp 22.2°c. Hygro Nil; ½ Rolling & pitching easily to following sea & swell; Sea temp 18°c. Clocks retarded 1 hour. Overtook small cargo vessel in the afternoon.

Sat. 17th July 71.

Azores D.F. stations on the Azores were fairly good; Terceira (LJ-396); Flores (FS-270); Graciosa (GRA-283), Horta (HOR-308) All noon the peaks of Pico (3350 ft.) were sighted visually but were out of radar range (approx 55 nls.). Noon:- 39°-25'N 29°-18'W Co 232° Dist 404 St. Time 25 hrs Av Sp 16.16 Revs 97.5; H.C. 38.5 D.C 1.4, Slip-Regatta, Dist x Eng 396; Wind NE by E 3/4; Mainly overcast, clear; ⊕ Err -25' (-6.18%) T.S.T 82.9 T.Dist. 1354; T.A.S. 16.33 kts. Clocks 2 hrs-GMT. Dist. to go 3272; Baro 1023.7 Temp. 25.5°c; Hygro occ. ½ high; ½ Rolling & pitching easily to quarterly sea & swell; Sea temp 20.0°c. Altered course on D.F. bngs at 1430 hrs. 39°-00'N 30°-00'W; ⊕ 1200; Co. 238(T). Porpoises sighted in the afternoon. 1615 hrs. Boat & fire drill - ship stopped & both boats swung out; no trouble with boat motor. Had traffic encountered during the day. Clocks retarded 30 mins. Allowed a stoppage of 18 mins. (0.3 hrs) for boat drill.

Sun 18th July 71

Whale sighted this morning. Noon:- 35°-57'N 36°-04'W Co 237½ from 1430. Dist. 384, St. time 24.2 hrs. Av. Sp. 15.86, Revs. 36.8 H.C. 95.6. D.C. 1.1

13

Slip-2½%; Dist x Eng. 376 Wind NNE 4 to VAR 2, Mainly ocast; clear; ½ Rolling & pitching easily; Δ Err - 23' (-5·98%) T.S.T. 107·1 hrs. T.D. 1738 mls. T.A.S. 16·23 KTS. Clocks G.M.T. - 2·30. Dist. to go 2888; Baro 1022·1, Temp 27°c. Sea Temp 25°c. Gyro error ½° HIGH. Clocks retarded 30 mins.

Mon. 19th July '71. One vessel on reciprocal course sighted on the 00-04 watch. Phosphorescence present. Another ship later on. Flying fish sighted this morning. Noon:- 32°-24'N 42°-44'W C. 234½, Dist 345 St. time 24·3 hrs. Av. Sp 16·12, Revs 46·0 H.O. 37·3 D.O. 1·2 Slip: Nea. Dist x Eng. 382 Wind NWly 3/3, Cloudy & clear; Δ Err -34 (-8·60%) T.S.T. 131·6 hrs T.D. 2133' T.A.S. 16·21 kts. Clocks GMT - 3·0 hrs. Dist. to go 24·43; Baro 1024·2, Temp 28°c, Sea Temp 24½°c. Gyro error ½° HIGH. ½ was a little to the southward of the course line today. N.A. Routing chart for July gives currents variable for this area. 1754 Stbd engines - Engine Cmny, Deck Cadet injured his head on starboard window on bridge. Ocean Weather Ship "ECHO" 4YE, contacted. "Echo" about 280 miles away (ECHO - LAT. 35°-0'N LONG 48°-00W) our position LAT. 31°-33'N LONG. 44°-20'W. "Echo" does not carry a doctor, Edr contacted the York & gave us an Answer Surfic. Russian vessel heard our contact with Echo & contacted us direct saying that he had a doctor. 1833 7 mls ahead, course provisionally set for Bermuda; 1930 Course altered to 020°(T) to rendezvous with Russian tanker "MARCHAL BIRIOUZOV" U.S.S.R. At that time he was approx. 180 miles away & his speed 15 knots; his position 34°-25 N 43°-23'W; our D.F. was used to home-in on his signal & our course was adjusted accordingly. Clocks retarded 30 mins.

Tues 20th July 71. 0027 Target on radar 20'; speed off appeared 3·8 knots; sighted Russian ships lights @ 12 miles. V.H.F. Contact was not made until vessels were 7/8 miles apart. 0030 Log landed. 0114 ½ his closing. 0119 Eng sent lifeboat away:- Cdr:- T. O'Connor 3/c; C. Maguire 3/m; M. Doyle, EDH. J. Boyle. K. McLoughlin 4/m; J. Murphy; Cadet. A. Molloy J.O.S.; D. McDonnell, J.O.S. Boat first went alongside Russian's starbd side, but found better lee on her port side. ½'s were about 2½ cables apart but it took a lot of sweat & the towing gear to get there @ 0137. 0149 Lifeboat returning; 0201 Doctor, Ch. Eng & 3/o + who was also the Comissar boarded. The saloon was made the Operating Theatre, Lady rigged clusters for light etc: 0502 Doctor etc.

depart. 0524 Lifeboat alongside Russian. 0536 Lifeboat returning. 0600 Boat taken 0621 Boat housed. 0630 Full away: Pos'n. By Stars. 32°-55'N 44°-03' Co. for San Juan P.R. 19,000 DWT. R. Grace.
Russian ship was a loaded tanker bound for Havana, Cuba. & the Russians were a very friendly & genial lot, but of course there was the language problem.
Noon 32-00N 45-16W St. Time 18·4. Dist. 289, Av. Sp. 15·71, to go San Juan 1395, T.S.T. 150
T.D. 2422, T.A.S. 16·15. H.c 35·8, Dc 1·3, Revs 97·1 Dx Eng 291 Slip. 0·68 Revs 1028, Temp 89.
Sea temp 27·7° Gyro ½ H. Clocks 3½ hrs-GMT. Wind NW 2, Cloudy & clear, slight sea & low swell.

Wed. 21st July '71 Noon: 28°-14 N 51°-27'W; S.T. 24 hrs. Dist 394, A.Sp. 16·42, To Go 1001, Co. 235°, T.S.T. 174
T.D. 2816; TAS. 16·18; Hc 38·8; Dc 1·3. Clocks GMT-3½ hrs. NE-E 3/4 Mod Sea & low Swell; Revs 101
Dx Eng 394, Slip Nil, Revs 1025, Temp 28°c, Sea Temp 27·7°c, Clocks retarded 30 mins.

Thurs 22nd July '71 Noon: 26°-19 N 57-38W; S.T. 24·5 hrs Dist. 409, A.Sp. 16·60, To Go 592', Co 235°
T.S.T. 198·5; T.D. 3225, T.A.S. 16·25, Hc. 39·8, Dc. 1·2, Clocks GMT-4 hrs. ESE 4, Cloudy & clear, Mod. sea & swell; Revs. 101·8, Dx Eng 408, Slip negative, Revs 1022, Temp 31°c, Sea temp 28°c: Gulf weed present.

Fri 23rd July '71 Some Mer. Altitudes @ Noon:- Dec. 20°-07'N !!
Rain showers in the morning - clearing later. Noon: 20-23 N 63°-21'W
S.T. 24·0 hrs. Dist 397, Av. Sp 16·54 To Go 195, Co. 233½°, 4 Revs-6·04½'; T.S.T. 222·5, T.D. 3622, T.A.S.
16·28, H.c. 41·1, Dc 1·2, Clocks GMT-4 hrs. (Puerto Rico Time); Revs 101·7; Dx Eng 397, Slip. Nil:
Lights on C.S. Juan, Del Morro, sighted 20'; ½ Set 2° to the westward, no set allowed for since noon; Set increased as coast neared & is particularly strong at entrance to San Juan hr. Numerous shore lights & radio masts can make lights on the coast difficult to identify. Pilot boarded at entrance channel about ½' NNW of Pta Del Morro.

Sat. 24th July '71. @ 0030 Casket & Buoy not where it should be found; ½ did not anchor; turned about round in harbour: total delay 1 hr & 12 mins. Strong west going set experienced on south coast of P.R. Rincon light very dim indeed. Borinquen light good & strong, Punta Tuna all clear. Searchlight & Morro very good marks ranges: 25°-36'. Searchlight is conical shaped & Morro is flat-topped with sheer sides. Small boat encountered in Mona Pass. Speed over the ground in Mona Pass. 17 knots. Noon:- 17°-23'N 68°-47'W (Must be in altitude, live. 19-55N.) St. Time 22·8 hrs.
Dist. 369' Av. Sp 16·18 To Go 813, Co. VARS. T.S.T. 245·3, 399 T.D.; T.Av.Sp 16·27, H.O. 40·6
Dc. 1·4. Clocks G.M.T. - 4 hrs. Revs 100·2, Dx Eng 372; Slip. 8%. Wind E x S 3/4 Cloudy & Clear.
At small tug towing a long narrow barge was encountered about 4 miles west of San Juan, towing speed 12 kts approx. his movement was left-sided (croat-fashion), his lights deceptive, a dangerous son of a —. Boat muster & fire drill @ 1615 hrs. Clocks retarded 1 hr.

Sun. 25th July '71 0130 Reduced to 94 revs. fire in boiler air heaters, starboard.
Noon:- 13°-32'N 74-29W Co. 235°T, Dist. 404. Av. Sp. 16·16; S.T. 25 hrs. Ely 4, Mod Sea & Swell.
Set to Westward 8 miles.

Panama Canal to Guayaquil, Ecuador.

Mid-way Ā:1 & Sea Buoy. to Taboguilla (270° x 2')	Co	155°	Dist. 5·0
Ia. Taboguilla to Ia. La Plata. (090° x 6')	Co.	189°-37'	Dist. 612·5
Ia. La Plata to Pt. Elena (084° x 5')	Co.	174°	Dist. 56·5
Pt. Elena to Pt. Ancon (059° x 5·5')	Co.	149°	Dist. 13·5
Pt. Ancon to Sea Buoy.	Co.	122°	Dist. 39·5

River Pilotage 50' Total Dist. 727·0

Positions:-

Ia. Taboguilla.	Lat. 8° - 48' N	Long. 79° - 29' W
Ia. La Plata.	Lat. 1° - 16' S	Long. 81° - 11' W

Time Zones:- Panama. G.M.T. minus 5 hrs.
Ecuador. G.M.T. minus 5 hrs.

Steaming Time @ 16·0 knots. 1 day 21 hours 30 mins.

Guayaquil to Chimbote Peru.

Sea Buoy to Cabo Blanco (Brg. 122 x 6' / 121° x 5')	Co	212° T. / 211° T.	Dist. 105·0
C. Blanco to Pta. de Pariñas (Brg. 105° x 7½')	Co.	195° T.	Dist. 25·5
Pta. de Pariñas to Pta. Falsa (Brg. 082° x 5')	Co	172° T	Dist. 84·0
Pta Falsa to Lobos de Tierra (Brg C58° x 5·3)	Co.	148° T.	Dist. 34·5
Lobos de Tierra to Is. Santa (Brg. 050° x 4')	Co.	140° T.	Dist. 202·0
Is. Santa to Pasaje del Norte.	Co.	090° T.	Dist. 6·0
		Total Dist.	457·0

Steaming Time @ 16·0 knots. 1 day 4 hours 36 mins.

Chimbote to Callao Peru.

Pasaje del Norte to 1ts Ferrol del Norte (090° x 4')	Co.	228° T.	Dist. 5·0
1ts Ferrol del Norte to 1a Mazorca (069° x 3¼')	Co.	159° T.	Dist. 147·0
1a Mazorca to Callao Breakwater.	Co.	137° T.	Dist. 53·0
		Total Dist.	205·0

Steaming Time @ 16·0 knots. 12 hours 48 mins.

LAO TO MATARANI, PERU.

ENTRA TO BUENO TO EL CABEZO (150° x 1')	Co. 270°	DIST.	¼ MLS.
EL CABEZO TO HO MAL NOMBRE (090° x 1·9')	Co. 230°	DIST.	2·0 "
HO MAL NOMBRE TO LA SAN GALLAN (068° x 5')	Co. 158°	DIST.	117·5 "
LA SAN GALLAN TO PTA CARRETAS (061° x 5')	Co. 151°	DIST.	24·0 "
PTA. CARRETAS TO PTA. DONA MARIA (054° x 5')	Co. 144°	DIST.	36·5 "
PTA. DONA MARIA TO PTA. PARADA (045° x 6') (047° x 8½)	Co. 135° (137°)	DIST.	60·0 "
PTA. PARADA TO PTA. ATICO (032° x 5½) (032 x 9')	Co. 122°	DIST.	101·5 (103·0) "
PTA ATICO TO PTA. ISLAY	Co. 113° (112°)	DIST.	103·0 (104·5) "
		TOTAL DIST.	450·0 "

STEAMING TIME @ 16·0 KNOTS:- 1 DAY 4 HOURS 6 MINS.
" " @ 15·0 KNOTS:- 1 DAY 6 HOURS. 00 MINS.

TARANI TO ETEN/PIMENTEL PERU.

BREAKWATER ENTRANCE TO PTA. CORNEJO (023° x 5½')	Co. 282°	DIST.	12·0 MLS.
PTA CORNEJO TO PTA. ATICO (032 x 9')	Co. 293°	DIST.	91·0 "
PTA ATICO TO PTA. PARADA (047 x 8½')	Co. 302°	DIST.	103·0 "
PTA PARADA TO PTA. DONA MARIA (054 x 5')	Co. 317°	DIST.	60·0 "
PTA DONA MARIA TO PTA CARRETAS (061° x 5')	Co. 324°	DIST.	36·5 "
PTA CARRETAS TO LA. SAN GALLAN (068° x 5')	Co 331°	DIST.	24·0 "
LA. SAN GALLAN TO LA MAZORCA (069° x 3¼')	Co. 334°	DIST.	164·0 "
LA MAZORCA TO LA. MACABI (064° x 5')	Co. 334°	DIST.	239·5
LA MACABI TO ETEN PIER BRG. 011° x 8·4'	Co. 336°	DIST.	51·0 "
TO PUERTO ETEN	Co. 000°	DIST.	8·0 "
TO PIMENTEL	Co. 336°	DIST.	10·5 "
SANTA ROSA BRG 066° x 4½'	Co. 002°	DIST.	4·5 "

TOTAL DISTANCE MATARANI TO ETEN. 789 MILES.
ST. TIME @ 16·00 KNOTS. 2 DAYS 1HR. 18 MINS

TOTAL DISTANCE MATARANI TO PIMENTEL. 796 MILES
ST. TIME @ 16·00 KNOTS. 2 DAYS 1HR. 48 MINS.

6th July '71 Noon 10°-01'N 79°-34'W Co. Vges Dist. 366, S.T. 24 hrs. Av. Sp. 15.2 kts. ESE-4, Mod. Sea-Swell Cloudy & Clear. H.O. 3·8, D.C. 1·2, Revs 89·7, Dist × Eng 346' Slip Negative; Set again to the westward; a bit of traffic

IAL / RIDI. IAL C.2. Aleo beacon, Cristobal, Francefield FTZ-326 was of some assistance in making a landfall. Tavallon Socio (Dirty Rock) was not sighted on radar until 9½' off; rain shower obscured it til later, when sighted visually late it was easily mistaken for Cayos Duarte, the white light tower of Tavallon Socio is very small indeed when viewed from seaward. Strong NE-going set experienced between Tavallon Socio & Cristobal. Little traffic. Breakwater sighted visually with binoculars at about 9/10 miles. E.O.P. @ 1500 hrs. E. BREAKWATER bng 191° 3½', Co. Vges. Dist. 39 miles; St. Time 3·0 hrs. Av. Sp. 13·00 knots NE×E-4 H.O. 4·0, D.C. 0·2, Revs 91·9, Dist × Eng 45' Slip 1·4% TOTAL DIST. 4800 miles TOTAL ST. TIME 297·3 hrs.; TOTAL AV. SP 16·15 knots.

The West Breakwater light was non-existant, light-tower & all gone. 1819 hrs. ½ entering between breakwater heads. 1525 Pilot, Mr KRIOTHIN & boarding officer on board. 1540 Let go starboard anchor; 1545 Draught aft 30' on deck. Position E. Breakwater bng 020° T × 1·4 mls. Have learned that the West Breakwater light tower was clobbered by an Italian ship & not rebuilt. Before entering breakwater contact was made with "Cristobal Radio" on V.H.F. Ch. 12. 1731 hrs. pilot on board Mr. R. Teale. 1747 Anchor aweigh, proceeding to berth. 1809 Tugs in attendance F. "MORROW" A. "CHESTER HARDING" 1842 hrs ½ in position. 1845 Finished with engines; ½ berthed at Pier 16 starboard side to. 1913 Commenced bunkering. 2115 Completed loading Diesel fuel. 2330 Completed bunkering APOLLX. 400 tons H.O. & 20 D.C. Draft on arrival 14'-01" (F) 19-05" (A)

27th July '71 0145 Nav. gear tested. 0205 Pilot on board; tugs (F.) "CHESTER HARDING" (A) "TRINIDAD II" 0241 Let go F & A, vessel leaving berth. 0250 ½ swung off Pier 16 head; tugs gone & vessel proceeds to canal entrance; 0329 Canal crew boards. 0343 Approaching Gatun Locks. 0412 Entering first chamber Gatun Locks. 0415 Lock gates closed. Average length of time in each of three chambers was 11 mins. 0509 Clear of Gatun Locks, canal crew disembarks. A Chinese vessel (Nationalist) was seen sunk at the Pedro Miguel side of Gaillard ("SIAN JUNG")

Cut, boat deck award, bridge, funnel & masts visible, we are told that the Helenmoor went hard over the wrong way and the vessel ploughed into the bank, he cargo-nice. 0847 Entered Pedro Miguel lock 0857 fast in lock; awful rain shower. 0912 Left lock. 0921 tied up at lay-by, mule wires were let go & ship's lines were used as the lay-by, canal ever did the work of tying-up. 0940 Let go & proceed to Miraflores locks. 1021 fast in lock and another downpour of rain. 1054 ½ clear of Miraflores locks. 1114 Canal ever disembarks. 1125 Pass suspension bridge (or is it cantilever) 1144 Pilot away. 1200 F.A.O.P. Tocumilla bg 223°T x 3' Some traffic in the afternoon; we were overtaken by the "Frubel Maia" doing 20 knots. Liberian tanker "Sun-something" blew out a cloud of black smoke like a volcano, stopped & put up his two black balls; hours later she could still be seen on the horizon smoking away. Pta. Toro did not show on radar until it very suddenly came in at 18 miles. Rev. speed down the Gulf of Panama 15½ knots. Draft sailing Balboa F 15'-00" A 20'-06"

Wed 28th July '71. Noon :- 2° 41' N 80° 27' W. Sr. Time 24 hrs. Dist 374' Av. Sp 15.58 kts. Dist to go. 353' Co. 189°T. H.C. 35°C; D.C. 1·3 ℃. Revs 94·5, Sl E. 369' Stff Reg. Sky 4/8 Cloudy & Clear. ½ Rolling & pitching mostly. ½ set 5' eastward @ Noon. D.F. in afternoon; Esmeraldas, Manta & Tumaco & Soldado; again set eastwards.

Thurs 29th July 71

Pta. Galera, C. San Francisco & Pta Ballena not sighted on radar. Crossed the Equator @ 2030 hrs. 28th July '71. C. Pasado showed on radar 26' ½ had set 5½ miles to the eastward. Strong inshore set from C. Pasado to Bahia de Manta. Set ceased off Pto. San Mateo & C. de San Lorenzo & ½ a speed over the ground increased to 17 knots. C. de San Lorenzo showed on radar at 24' & Se. La Plata showed at 25' The light on La Plata was sighted visually at 12½ miles. The set was offshore when abeam of La Plata & ½ a speed increased to 18 knots. Se. Salango showed on radar at 20'. Pta. Santa Elena & Pto Ancon were good radar targets but the rest of the coast SE'wards was poor. Set offshore at Pta. Santa Elena. Very strong echo in the vicinity of Engabao del Morro. Pta. Piedras del Morro showed on radar fairly good; the set here was very small indeed. some-

-times onshore & sometimes offshore. The sea buoy was black in colour. Contact with pilot station on V.H.F. Ch 16 was good & clear, but pilots have little English. Pilot boarded @ 1021 hrs. between No 1 & No 2 buoys. E.O.P. @ 1006 hrs. Sea Buoy brg 180° x 0.2' Dist 353' St. Time 22.1 hrs. Av. Sp 15.98 knots; H.O. 34.5 tons D.O. 1.1 tons. Revs 96.9. 2 x Eng. 348, Slip Negative. Total distance 727 nmls. Total St Time 46.1 hrs. Total av. speed 15.77 knots. Wind SSW 4 Ocast & clear; 0649-0652 Vis. Poor Pilot Mr. Rene Santos. 1316 ½ rounding Pta. Samper. 1310 Tugs in attendance (F) "TRITON" (A) "TOTETO" 1419 ½ alongside, 1430 Tugs away, all fast, F.W.E. Vessel berthed starboard side to at Dodega No 5, Puerto Maritimo de Guayaquil, Ecuador. Draft arrival (F) 15-01 (A) 20-02 The quay is equipped with sheds & very good lights at night. There are no dock side cranes. Thieves & wholes abound in canoes on the river, a watch over the stern has to be kept when testing the steering & wrong way clears. The dockers got at booze in the reefers No 2 T.D. by forcing off the padlocks. Fresh water is laid on to the quay. The mooring lines have to be watched because of the rise & fall of tide, the quayside fendering is good. Three gangs discharging & they were slow. There was an earth tremor in Guayaquil on Monday 26th - 2 lives lost.

Fri 30th July '71

Completed discharging cargo @ 0300 hrs., cargo discharged 309 tons. Local pilot Sr. L. HIDALGO; River pilot Sr. L. Proaño, tugs "TOTETO" & "TRITON" Draft sailing (F) 13-11 (A) 20-01 Left berth @ 0446 hrs. 0520 Pilot away. 0842 F.A.C.P. 2 nmls 80°-2' W. Is. Santa Clara was a good radar target. Oil rig sighted westward, position from Santa Clara brg 312° x 23.2 miles. Noon: - 3°-13 S. 80°-46' W. Co'rses. Dist 143' St. Time 3.3 hrs. Av. Sp. 13.03 knots (one boiler) SW x W 3; Slight Sea & Low Swell, Ocast & clear. H.O. 3.3 D.O. 0.2. Revs. 79.7. 2 x E 143 Slip Nil. Numerous small fishing craft with white sails & motor power were encountered last afternoon off C. Blanco. The set was generally northward. Oil tanks on C. Blanco were very good radar targets. There were many oil rigs between C. Blanco & Pto. de Pariñas & a tanker was at anchor off C. Blanco.

at 31st July '71 The lights on La Toca & on Pta. Aguja were not sighted although the visibility at the time was fairly good. Noon:- 7°-28 S 80°-06 W Ca Vars. Dist 235' Av. Sf 11.87 (one boiler) T.D. 328; T.S.T. 273 hrs.; T.A.S. 12.01 kts. N.C. 21.0; D.C. 1.1; Revs 75.4, D x E 296' Slip 0.35%. Boat & fine drill Em 1615 hrs. 232 hrs. E.C.P. Ite Forrol del Norte brg 144° T x 1½' Ca. Vars. Dist. 134 mls. St. time 11.2 hrs. Av. Sf. 12.07 kts. HO. 10.5; DO. 0.6; Revs. 73.6; D x E 134; Slip - Nil. T.D. 462' T.S.T. 38.5 hrs, T.A.S. 12.03 kts. Wind SSE-4; Wod. sea & swell, overcast. Entered Bahia Ferrol by Paraje del Centro. Numerous fishing vessels completely encumbered the anchorage marked on chart N° 2332, "La Azimuth brg 273° x 1.25 miles. We found satisfactory anchorage in position La Azimuth brg 299° x 1.14 miles, southern end of La Blanca brg 230° x 1.38 miles; depth of water 5 fms. Fishing fleet laid up for July & August.

on 1st. Aug '71 0002 hrs. let go starbd anchor. 0012 brought up to 3 shackles in the water, port officials board. 0720 Pilot boards M.V. S. Alexandre & J. Manuel Castro. 0729 Anchor away & vessel proceeds to berth, two small tugs in attendance. 0828 All fast F & A; F.W.E., vessel berthed starbd side to at Mineral pier, Cimbate; Estuary, one quay sounded 0830 hrs. The pier is fitted with a 5t gantry with grabs & a conveyor for washing ore, etc. There was a bit of a surge at the berth - heavy springs were used. A Greek cargo ship was berthed at the other pier which lies about 3 cables westward of the mineral pier & has 3 modern cranes on it. A narrow gauge railway runs on the mineral pier (gauge 36 inches) The light on the north side of Paraje del Norte was unlit & the light on Ra Blanca was showing Fl wh, Red, 2 Sec. Cimbate had a severe earthquake on 31st. May 1970 with the epicentre near Bahia Ferrol. Draft on arrival: (F) 13'-08" (A) 19'-10" Cargo discharged (Crates of tractors & wheels) 39.2 tons. Finished discharging cargo at 1706 hrs. 1748 " leaving berth. Draft on sailing (F) 13'-02" (A) 19'-11" Terrible interference on the walkie-talkie radios. Tugs: "Don Amador" & "Labaltha" in attendance. F.A.O.P. @ 1836 hrs. 0.75 mls north of Isleta de Ferrol del Norte.

Mon. 2nd Aug. '71

Sa Mazorca showed on radar at 20 miles & the light was seen flashing at 15 miles. Some traffic was encountered from Promontorio Salinas & southwards along the coast. When approaching Sa Mazorca from the northwards the set was offshore. 0525 hrs. Sa Mazorca abeam to port 2½ miles.
ARRIVE CALLAO. E.C.P. @ 0848 hrs. Punta Punta bng 145° x 4'. Co. Vlgs. Dist. 202', St. time 14·2 hrs Rv. Sf. 14·22 hrs. Wind Sly 2/3, Slight sea & Mod. swell, coast clear. HO. 17·7; DO 1·0. Revs. 85·9. D. x Eng. 198' Slip. Negative. 0910 Let go stbd (PUNTA PUNTA 3¼·9° x 2·3') anchor. 0918 ½ brought up & 3 shackles on deck; pilot & officials board. 0933 Anchor aweigh & proceeding inwards. 1002 tug "Bellavista" in attendance, 1015 All fast FA A; tug & pilot away; F.W.E. ½ berthed port side to at Muelle Marginal on the north end. Draft on arrival (F) 13'-04" (A) 19'-10" There were a number of vessels at anchor outside the breakwater; on the south side of the entrance channel, in the restricted area there were many fishing vessels & Peruvian naval craft. Merchant vessels, many of them flying on in years were at anchor on the north side of the entrance channel, among them were the old "Coral Rose, now the "Rio " and the Italian liner "GINZANNI " 103 Labour on board - 3 gangs - no shore side cranes, ship's derricks used. Distressing situation N° 2 tweendeck starboard reefer space :- dockers refused to step down cases of beer while discharging & the last consigned - 24 (assorted) cases were damaged. Worked cargo until 2300 hrs.

Tue 3rd Aug '71

3 gangs on board this morning @ 0730 hrs. Cleaning gang working throughout the day. 1730 Asphalt machine (10 tons) discharged from N° 2 Lower Hold. The crane was worked by the bosun & his men. Worked cargo until 2300 hrs. Shore personnel began painting C.P.V. colours on the funnel. Fresh water is taken from a water barge alongside. Heavy moorings for working barges alongside were delivered on board.

Wed & Th. Aug '71

Dockers & stevedores on board @ 0730 hrs. Completed discharging cargo at 1425 hrs. Discharged 1226·4 tons. Draft sailing (F) 16'-06" (A) 18'-05" 1330 hrs. commenced singling up FORA; Tug "Bellavista" & tug "Capra" in attendance. 1545 Let go FORA; 1549 Clear of berth. 1600 Pilot disembarks. 1612 F.A.O.P. 28 miles west of the breakwater. 2345 San Juan Lo. bng 118°T x 9·1 miles. P/C 151°. Mainly cloudy & clear with mod. sea & swell; wind SSW-4.

Thurs 5th Aug '71. 0130 hrs. Pta. Corrales bng 061° x 5¼'; 0405 Pta Dona Maria bng 054° x 5·7'; 0737 hrs. Pta Parenda bng 036° x 8·2'. Noon:- 16°-05's 14°-18'W; C.Vars. Dist. 32'; St. time 19·8 hrs. Av. Sp. 15·75 kts Wind SE-4/5; O'cast with benign haze, mod. sea & swell. Revs 983 1400 hrs. Pta Africa bng 043° x 9·0'. 2000 hrs. E.O.P. Pta Eslaig bng 089° x 9'. Co. Vars. Dist. 130 obs. St. time 8·0 hrs. Av. Sp. 16·25 kts. Wind SE 4/5, Mod. sea & swell; mainly o'cast & clear. T.D. 442' T.S.T. 27·8 hrs. T.A.S 15·89 kts. Draft on arrival (F) 16'-04" (A) 18'-00".

Fri. 6th. Aug '71 ARR. MATARANI Due to the slight amount of water, vessel did not anchor but stood off for the night. The pilot boarded at 0623 hrs. The tugs were alongside at 0628 hrs. "ARICO" A. "MAJES" The after tug made fast on the quarter with his own line but the fwd tug used the ship's towing spring. The entrance to the harbour is narrow & tricky. Pilot - Luis Romero. 0720 hrs vessel alongside & working first; the linesmen were a useless shower of —— 0730 hrs All fast, tugs & pilot away F.W.E. 0735 hrs. 2 gangs on board, preparing derricks, etc. 0830 hrs one gang of dockers aboard. 0835 hrs. commenced discharging cargo. Vessel was berthed starboard side to on the SW most berth, the sternlines were lead across to the end of the breakwater wall & heavy springs used - a bit of a surge in the harbour at times. The fendering on the quay is good. The quay is fitted with a conveyor system, a small grain sucker, sheds & railway (gauge 4 ft. 8¾ ins.). There are no shoreside cranes. There were two steel lighters in the harbour & fishing vessels off Muelle Muinet Pesquera & fresh water

is hard on the quay. Extension work was in progress on the sheds, etc. at the southern end. Derrick at No 5 hatch was doubled up to the lift fork-lift truck aboard to handle pallets in the lower hold. The water in the harbour was very clear - they haven't got a pollution problem here yet. 1807 Inflated disch cargo 1447.3 tons. Deep tanks were run in that afternoon. Vessel took some heavy rolls when passing the breakwater entrance. The statue (Carnefic.) on the hill was not at all as conspicuous. Vessels can sail at night but cannot enter at night. The leading lights are only switched on when a ship is sailing; the rocky cliffs around the entrance are floodlit; a heavy surf runs into the caves abreast of the entrance; the light on Pta. Salay is good. Large groups of seabirds (pelicans etc.) give an echo at times on the radar. 1910 hrs. singling up. 1921 Let go. The competency & ability of the tugs & linesmen left much to be desired - heated verbal exchang took place in both Spanish & English. 1932 Clearing breakwater. 1940 Pilot away. 1942 F.A.O.P. Pta Salay bng 146°T x 1·3 mls.

1. 7th Aug '71. 0200 hrs. Pta Altica bng 001° x 11'; 0313 Pta Pinarda bng 025° x 9'. 1200 hrs. Pta Dona Maria bng 047° x 7'. Position fixes off Pta. Dona Maria bore out the note on the chart - coast about 5 miles southwards of the point lies 1½ mls further seaward than charted. Noon - 14°-45's 76°-00'W, Co. Vars Dist. 265' St. time 16·3 hrs. Ht. Sy. 16·25 hts. Wind Var. 3/4; Mod swell, o/cast. Revs. 98·3, 2 x E. 21', Slip negative. 1400 hrs. Pta. Coronetas bng 066° x 6½ mls. 1500 Pta Huacos bng 042° x 9·2 mls In Sea Gullan (1363) very sensitive. Liner vessel, possibly on his way to Pisco, passed between Sea Gullan & the mainland.

2. 8th Aug '71 0130 hrs. Is. MAZORCA bng 094° x 4·4 mls. IsMAZORCA showed up on radar @ 24 miles, & the light was sighted visually at 9 miles. Some traffic around the islands. On approaching Mazorca from southwards there was a strong inshore set & when north of Mazorca the set was offshore. Is. PELADO (150 ft.) was sighted visually at 4½ miles, overcast - full moon of 6th Aug. Noon:- 8°-45's 79°-07'W Co. Vars. Dist. 403, S.T. 24 hrs. Ht Sp. 16·79, Wind S-3/4 o/cast with large. Slt sea & mod. swell. H.O. 36·0.; D.C. 1·1. Revs 100·5, Slip neg. 1525 hrs. Is MACABI bng 055° x 5½ mls., showed on radar 16 mls.

3.3 + 3.4 = 6.7

~~899~~

Eten to Panama.

Eten to Lobos de Tierra (Log 022° × 6')	Co. 292°	Dist.	63 miles
Lobos de Tierra to Pta. Falsa (Log 053° × 7')	Co. 323°	Dist.	35½
Pta Falsa to Pta. Parinas (Log 082° × 7')	Co. 352°	Dist.	84
Pta Parinas to Is. La Plata (Log 095° × 6')	Co. 005°	Dist.	206
Is La Plata to Taboguilla (Log 270 × 2')	Co. 010°	Dist.	612½
Tabogilla to Anchorage (Fairway Buoy 270° × ½')	Co. 347°	Dist.	4
		Total Dist.	1005

Positions - Is. La. Plata ; Lat. 1°-16's 81°-11' W Long. Co. 009°-37'
Tabogilla ; Lat. 8°-48'N 79°-29'W Long. Dist. 612·6 miles

Steaming Time :- @ 16 Knots. 2 days, 14 hours, 48 mins.
@ 15 Knots. 2 days, 19 hours, 00 mins.

Panama to New York.

Colon Breakwater Head.	Co. 000°	Dist	1 miles
1' North of Breakwater to Navassa Is. (11·7 × 5')	Co. 027°	Dist.	612
Navassa Is. to Cape Maysi (Log 300 × 7)	Co. 030°	Dist.	121
C. Maysi to Castle Is. (Log 080° × 3½')	Co. 350°	Dist.	117
Castle Is to Long Cay, South Point (082° × 5)	Co. 352°	Dist.	27
Long Cay to San Salvador (Log 275 × 6')	Co. 005°	Dist.	92
San Salvador to Barnegat (Log 272 ×)	Co. 002°	Dist.	942
Barnegat to "BA" Buoy (Log 265° × 1')	Co. 358°	Dist.	35
"BA" to Ambrose 7th (000° × 0·2')	Co. 337°	Dist.	7
	Total Distance Colon to Ambrose.		1954

Steaming Time :- @ 16 knots. 5 days, 2 hours, 6 mins.
@ 15 knots. 5 days, 10 hours, 18 mins.

Positions :-				
Colon Breakwater; 1' North.	Lat. 9°-24'N	Long. 79°-55'W	Co. 27°-26·6'
Navassa Is.	Lat. 18°-27'N	Long. 75°-06'W	Dist. 612'
San Salvador to ⚑	Lat. 24°-05'N	Long. 74°-20'W	Co. 1°-36·8'
Barnegat.	Lat. 39°-46'N	Long. 73°-41'W	Dist. 941½

Distance Colon to San Salvador 970 miles.

New York State Time G.M.T. - 5 hours. But keeps Summer Time from Last Sunday April to Last Sun. Oct.
(Summer Time G.M.T. - 4 hours.)

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ARRIVE ETEN 8TH AUG'71 1830 hrs. E.O.P. Pier Eten bng 026°T x 7'; Draft 11'3", S.T. 6½ hrs. Av Sp. 17.38 nts. T.D. 781' T.S.T. 46 8; T.A.S. 16.68 nts. Wind S3 decr with hedge. Revs 98·4, Dec E 104, Slip Neg. 1922 hrs. Let go starboard anchor. 1834 hrs. Brought up to 5 shackles on deck, in 8 fathoms of water; Position Eten Pier bng 046°T x 1·26 miles.

9th Aug'71 at Sabeq.

Commenced loading a cargo of sugar this morning at anchor. The sugar is brought on to the pier by railway (a very old steam locomotive) and loaded into wooden lighters by steam cranes on the pier. There is a total of 11 lighters & these are towed out to ships at anchor by four launches "ETEN" "BERTA" "CHICLAYO" & "LAMBAYEQUE". The McGregor hatch lids are split, the bags of sugar are lifted aboard by the ships gear; the bags are received at the hatch with dock stevings which are withdrawn & the cargo is trimmed down the hatch. 800 tons a day can be loaded by this method. Five gangs booked @ 0800 hrs. & commenced loading at 0915 hrs. To facilitate loading vessel shifted anchorage this morning 1131 S.B.E. Commenced heaving anchor. 1145 Anchor aweigh. 1205 Let go starboard anchor. 1214 Brought up to 5 shackles in the water - position Eten Pier bng 074° x 0·98'. 1613 Boat & fire drill. Loading finishes at 1700 hrs., the barges are returned to their moorings at night. At anchor the vessel rolls heavily at times, ships head lies about 160°(T). No cargo worked Sunday 15th Aug'71. 17th Aug'71, 1615 hrs. Boat & fire drill, starboard boat lowered. Tues, 17th Aug.'71 No cargo worked today due to heavy swell running on pier; flag signal "UM" flown from mast at head of pier. Shifted anchorage due to swell; 1400 Commenced heaving anchor. 1409 hrs. anchor aweigh. 1444 Let go starboard anchor. 1450 Brought up to 6 shackles on deck in 12 fms. - position Eten Pier bng 088° x 4·2' Wed. 20th Aug'71 Shifted back to the inward anchorage this morning at 0530 hrs. but cargo was not worked due to the swell. Sat, 21st. Aug'71 no cargo again today & shifted to outward anchorage again at 0844 hrs to 1034 hrs. Starboard anchor, 6 shackles in the water. No cargo worked Sun, 22nd Aug'71. Moved back to inward anchorage on Mon 23rd Aug'71 from 0636 hrs. to 0735 hrs. & Continued loading cargo.

2nd Aug 71 Wooded range again today. 2313 hrs. Vessel shuddered twice in quick succession, accompanied by rattling noise as if through anchor cable. I slept through this earth tremor – it has been described to be as like a motor vessel suddenly going full astern.

25th Aug 71. 1644 hrs. Cargo loaded & Labour disembarked. Swept on sailing (F) 28'-00" (A) 29'-01" Cargo 9277 tons (Cane Sugar); No cargo carried in reefer spaces & Deep tanks. 1731 hrs commenced heaving anchor. 1743 Anchor aweigh. 1754 F.A.O.P. Eten Pier bng 085° x 1·7' obs.

Wednesday 26th Aug 71 0130 hrs Pta Falsa bng 060° x 8·5 obs. 0709 Pta. de Barinas bng 072° x 7·3 obs. Noon:- 3°-13'S 81°-19'W; S.T. 18·1 hrs Dist. 272, Av. Sp 15·01, Co Vars. Wind SSE ¾ Cloudy & clear, Slight sea & Mod. swell. C. 23·7; D.C. 0·8; Revs. 89·4 D+E 263.

2100 hrs. In. to LA PLATA 07·1° x 6·3' Set was offshore off LA PLATA & C. de San Lorenzo. ½ speed over the ground 14 kts; on the way southwards the speed over the ground was 18 kts. Offshore set off Pta Santa Elena

Friday 27th Aug 71 Noon:- 2°-07'N 80°-31'W Co. Vars Dist 331 mls. S.T. 24 hrs. Av. Sp. 13·79; T.D. 603, T.S.T. 42·1, T.A.E. 14·32. Wind SW 3/4, Mod. Swell, Clear & Hot 37° C, C. 0·9, Revs. 90·6; D+E 277. Slip 11·07%. Set to continue.

Sunday 29th Aug 71 Left Balboa on radar @ 17 hours 7°-57'N 79°-41'W Co. Vars Dist 353 mls S.T. 24 hrs. Av Sp. 14·79, T.D. 953; T.S.T. 66·1 hrs. T.A.E. 14·42. Wind SW ¾ 33 ¾ knots; Overt, clear, Slight sea & low swell. H.C. 38·0 D.C. 1·1, Revs 88·5; D+E 386; S 0·3 Slip. In Balboa on radar @ 20 hours Tanker. E.O.T. (a) 1100 hrs Tabequilla D. bng 276° x 1·2 obs Dist 8·5. S.Time 41·0 hrs. Av Sp 12·26 kts. Total Dist. 1011 Total S.Time 71·1 hrs Total Av. Sp. 14·42; Fast 44 hrs. H.C. 6·2; D.C. 0·2; Revs. 98 D+E, 64 miles. Slip 15·18. Sea buoy 1624 hrs. 1636 Let go 5 fms anchor. 1642 Draught up to 30s on deck, 9 fms of water; Position Sea buoy bng 166° x 1·2' 2335 hrs. P.C.B. Mr. Cramer. Commenced heaving anchor. 2358 Anchor aweigh – commenced canal transit.

Draft on arrival (F) 28'-03" (A) 29'-03" Density 1020.

PANAMA CANAL TO NEW ORLEANS, LA.

COLON BREAKWATER TO RONCADOR BANK (024° x 10')	Co. 357°	DIST. 241
RONCADOR BK. TO QUITA SUEÑO (270° X 10)	Co. 322°	DIST. 80
QUITA SUEÑO TO 15°-17'N 81°-33'W	Co. 325°	DIST. 61
15°-17'N 81°-33'W TO S.W. PASS, SEA BUOY	Co. 331°	DIST. 825
	TOTAL DIST.	1307

STEAMING TIME @ 11 KTS. 3 DAYS 9 HOURS 42 MINS

LOUISIANA STATE TIME: G.M.T. MINUS 6 HOURS

G.M.T. MINUS 5 HOURS. (SUMMER TIME)

SUMMER TIME FROM LAST SUNDAY APRIL TO LAST SUNDAY OCTOBER.

COLON BREAKWATER: LAT. 9°-23'N LONG. 79°-55'W

RONCADOR BANK: LAT. 13°-15'N LONG. 80°-08'W

S.W. PASS, SEA BUOY. LAT. 28°-53'N LONG. 89°-26'W

SEA BUOY TO PILOTTOWN:- 20' PILOTTOWN TO NEW ORLEANS:- 50'

Sunday 29th Aug '71 0043 Ho. Canal commenced. 0120 in Entrance, Miraflores locks. 0125 ½ in first chamber. 0132 ½ breasting to 2nd chamber. 0138 ½ in lock. 0155 ½ clear Miraflores locks. 0212 Pilot P. Nugent locks. 0216 ½ in lock. 0230 ½ clear Pedro Miguel locks. 0242 ½ in chamber. 0248 ½ approaching Gatun locks. 0249 in first chamber. 0303 Entering 2nd chamber. 0306 in 2nd chamber. 0313 Entering 3rd chamber. 0315 in 3rd chamber. 0323 leaving 3rd chamber. 0344 Canal main channel. Visibility in F.W. (F) 28-06 (A) 28-06 Stores were taken from launch whilst passing Cristobal. 0506 Pilot away. 0824 F.A.C.P. & Breakwater Head. A strong E'ly set was experienced north of the breakwater; 3° left set allowed but vessel still set a little to the eastward. Noon: 15°-15'N 79°-56'W Co. 357°(T) Dist 52' S.T. 3.6 hrs. Av. Sp. 14.44 kts. Revs. 86.0; M.O. 3.8 tons D.O. 0.2 tons F.W. 50; Slight sea. Wind E'ly 3; Vis: swell, fair & clear.

Monday 30th Aug '71 Roncador Bank lt. was sighted at 15 approx & showed on radar @ 11'. Serrana Bank lt. was not sighted at 14'. Wreck on Quita Sueño Bank was observed on radar at 26'.

and the light was observed at 11. Soundings on the banks came in good. Noon 15°-56'N 81°-44'W Co. Vars. Dist. 367; S.T. 24 hrs A. Sp 15.29 Rev. 96.0. H.C. 37.0 tons; D.C. 1.1 tons D & E 375; Slip 2.13% Wind E x N to NE 3, Slight to mod. sea; low swell; Cloudy & Clear. Set at noon was approx 6 to the eastward.

Tuesday 31st. Aug '71. Noon: 21°-15'N 84°-56'W, S.T. 24 hrs. Dist. 374. A. Sp. 15.58 Co. 330°(T) T.S.T. 51.6; T.D. 795; T.A.S. 15.37; Slip 2.05% H.C. 39 tons D.C. 1.1 tons. Wind E by S 3/3; fine & clear, low swell. 1/L passed off Cabo San Antonio this afternoon at 1430 hrs. The land showed on the radar at 15 miles approx. but was difficult to identify due to the presence of many rain showers, and the slow easy curve of the headland does not help. The lighthouse (white tower) is hard to distinguish because of a background of trees of about the same height. Boat & fire drill this afternoon at 1615 hrs. Quite a bit of traffic encountered around Cabo San Antonio.

Wednesday 1 Sept. 71 Noon: 26°-4'N 83°-05'W Co. 332°; Dist. 373 miles, S.T. 24 hrs. A. Sp. 15.54; T.S.T. 756 hrs. T.D. 1166; T.A.S. 15.42; H.C. 39 tons, D.C. 1.2 tons. Wind E to SE x S 3/3, Slight sea & low swell; Cloudy & clear, Rev. 98.6; D & E 352; Slip 2.38%. When a landfall was made off the Mississippi Passes the vessel had set approx 16 miles to the east. The first light sighted was the South Pass (Fl. W. 30 sec.) D.F bearings were not very good. The first definite fix was a cross between the 100 fathom line & a bearing of the South Pass light. M/V Yarman passed ahead of us & also making for the S.W. Pass, by all accounts had also set a long way to the eastward. A tug, which had a large tow, was encountered off the S.W. Pass, there were no lights on the tow except what appeared to be an all-round green light which was more confusing than helpful. Some of the oil rigs between the South & South-west passes were very conspicuous. The pilots use 8 on Ch. 9, V.H.F. Pilottown Ch. 9. New Orleans C.G. 12, 13 & 16; Tugs 12 & 16; pilots at New Orleans, Ch 13 2242 E.O.P.; S.W. Pass 307° x 5½'; Co. Vars. Dist. 154; S.T. 10.7 hrs. A. Sp. 14.39 kts. T.D. 1320'; T.S.T. 86.3 hrs. T.A.S. 15.3 kts. Wind SSE to E 3/6; Cloudy & clear.

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slight sea & low swell; H.C 16·3 tons; D.C. 0·5 tons; Revs. 980; D.E 170'
Slip 9·14 %. 2310 hrs. P.O.B. Mr. C.P. LINCOLN

Tuesday 2nd Sept 71 ARRIVE NEW ORLEANS LA.

0118 hrs. changed pilots at Pilottown; 0617 Poverty Pt. 0636 Shingle Pt. 0714 Twelve Mile Pt. 0823 tug alongside on port shoulder. 0900: F.W.E, All FAST F & A. vessel berthed starboard side to at Stiverson Dock No 10 (end of Napoleon Ave.) A barge fitted with two steam cranes was moored between the ship & the shore. ~~Load~~ Commenced discharging cargo at 1300 hrs. The two steam cranes (fitted with grabs) were wet & noisy. The ship's agents T.J. STEVENSON Co., INC. 2838 International Trade Mart, N.O.LA. 70130 TEL:- (504) 525-9002; Mr. S.E. SIMPSON 242-7303 (home) & Mr. JESE L. VIDEL, 288-6449 (home). Chart & nautical instrument people here are BAKER, LYMAN & Co., INC. 323 Magazine St. N.O.LA. 70130. We were some stops during discharge due to rain - but they carried on until 2030 hrs. Discharged 612 tons. DRAFT: HLR. (F)

Wednesday 3rd Sept. 71 Worked cargo from 0800 to 2346 hrs. with lunch break 1200 to 1300. Explosives were used down the hold for scooping the cargo from the wings; the cargo was transe-shipped to railroad cars. Discharged 2,907 tons

Thursday 4th Sept 71 It rained all morning so no cargo was discharged; labour went ashore at 1000 & came back at 1300 the rain came again at 1435 hrs. and that was the end of cargo for the day. Discharged 408 tons.

Friday 5th Sept 71 Continuous heavy rain prevented cargo from being worked today, port official on board this morning.

Monday 6th Sept. 71. American Labor Day - no cargo worked. rain again today.

Tuesday 7th Sept. 71. Resumed discharging cargo at 0800 this morning Cargo for this berth discharged (1020 tons) & labour ashore at 1200 hrs. 1430 hrs P.O.B Mr. BRASICH. 1503 hrs. All gone F & A. Tug "SAGAMORE" Alongside; ¾ Records down river to anchorage. 1609 ¾ Swung in river & offer. anchorage. 1614 Let go starboard anchor. 1620 Let go port anchor 1622 hrs. ¾ Brought up to

both anchors; starbd 3 0's in the water; port 3 0's on deck; depth of water 10½ fms. ½ anchored off Chalmette, Pakenham Oaks, upriver of "Tenneco" Gas Pipeline crossing." There were many other vessels at the anchorage. Watch kept on V.H.F. Ch. 26 (New Orleans, La Marine Operator) Draft (F) 20-09" (A) 20'-00".

Wednesday 8th Sept. '71 At anchor; 0905 Boat & fire drill, port boat swung out.

Thursday 9th Sept '71 194 Tug "Madison" fast starbd bow. 1920 Pilot on board, N.W. Smith. 1941 Anchor aweigh, ½ proceeding upriver. 2028 ½ in lock on Industrial Canal. 2050 ½ clear of lock. 2133 ½ swinging of berth with tugs "Madison" & "Black Sea". 2206 hrs All fast F&A; F.W.E; Pilot & tugs away. ½ berthed starboard side to at Zenith terminal, Industrial Canal, Gulf Outlet.

Friday 10th Sept '71

Worked cargo today at "Zenith Terminal" 0800 to 2350 hrs. Discharged tons. Two big grabs used, but only one at a time can work due to capacity of conveyor belt. Stopped for a while this morning due to rain. The weather was hot & sticky & the mosquitoes were terrible; new ½ M.J. Kelly arrives.

Saturday 11th Sept '71. Stoppages in the morning & afternoon due to rain. Completed discharging all cargo at 2340 hrs.

Sunday 12th Sept '71

0800 hrs. tug "Edward Luckenbach" fast head; 0815 Pilot on board Mrs. E.C. Mayfield. 0824 ½ clear of berth. 0918 ½ entering Industrial lock. 0941 ½ clear of lock; 1008 ½ swinging in river. 1021 Let go starbd anchor. 1030 ½ brought up to starb. anchor, 4 shackles on deck; ½ in position just upriver of "Tenneco" gas pipeline crossing. Dig washing-out-holds-day.

Monday 13th Sept '71 Shifted anchorage this morning due to proximity of other vessels & gas pipeline 1124 Pilot Mr. Short on board & tug "Marine McDermott" in attendance, 1136 Anchor aweigh. 1145 ½ Swinging in river. 1221 Let go starboard anchor. 1225 Brought up to Starboard anchor, 3 shackles in the water, depth 40 fms position Nine mile point, 1·7 mls. south Sassenholm.

surveyors & agent on board in afternoon.

Tuesday 14th Sept '71 At anchor Nine Mile Point. A Greek ship "Delphic Eagle" coming up the river clobbered a Japanese vessel at anchor. The launch service while at anchor was very irregular.

Wednesday 15th Sept '71. At anchor.

Thursday 16th Sept '71. Hurricane "EDITH" came in this morning near Cameron, LA. and then over Lafayette LA. & Baton Rouge, LA. & on into the State of Mississippi; winds were 100 m.p.h. near the centre when she first came ashore, diminishing rapidly, central pressure 982 mbs. At the anchorage the wind increased in the morning from the SE & then veered S. force 6/7 with some very strong gusts at times. Let go second anchor (port) @ 0956 hrs. 1010 L brought up to 3 ois on each anchor. 1217 hrs. veered more cable to 4 ois in the water on each. Wind veered SSW & weather moderated in afternoon - port anchor hove up to avoid crossing the cables - wind continued to veer SW as the hurricane passed north of us, some very heavy rain squalls, flooding in many places ashore, deep tanks filled this morning. All was quiet & peaceful again at tea-time.

Friday 17th Sept '71 At anchor. 16.5 draft & fine until tide.

Sat 18th Sept '71 At anchor.

Sunday 19th Sept '71 At anchor.

Monday 20th Sept '71 At anchor. Fresh water taken from water barge alongside; it took four hours to load 100 tons. Thunder showers in the afternoon.

Tuesday 21st Sept '71. Pilot: Mr. Deutsch, 2035 Anchor aweigh, 2241 Tug "J.A. Bisso II" alongside. 2200 All fast F & A; F.W.E. ½ hour / stood aside to at Public Grain Elevator; berths infected with rats. DRAFT:- 9'-11" 15'-10"

Wed 22nd Sept '71 0700 hrs. Rigging gear & commence loading wheat in 3 STRATA. No 2 & 4 holds. Dunnage in No 3 tweendeck & No 4 tweendeck. 1730 Completed loading. Due to height of piling at pier B.C.T. gangway was used. Shifted to general cargo berth :- 1805 S.B.E. Pilot:- Mr G. Vinsans & Tug "J.A. Bisso I" FAST. Draft:- 22'-02" (F) 22'-07" (A) 1834 All gone F & A. 1940 ½ swinging in river. 2007 ½ alongside general

New Orleans La. to Galveston, Tex.

From S.W. Pass Sea Buoy	Co. 180°	Dist.	2½
Fairway.	Co. 218°	Dist.	61
Fairway.	Co. 265°	Dist.	129
Fairway.	Co. 323°	Dist.	27
Fairway to Galveston Whis Buoy.	Co. 305°	Dist.	113½
	Total Dist.		333 Miles.

Steaming Time @ 15 kts 22 hours 12 mins.
Steaming Time @ 16 kts 22 hours 48 mins.

Shorter Route

From S.W. Pass Sea Buoy	Co. 180°	Dist.	2½
Fairway to 28°-33'N 89°-40'W.	Co. 218°	Dist.	20
To 28°-15'N 91°-11.5'W.	Co. 256°	Dist.	83
To Fairway Junction	Co. 271°	Dist.	93½
Fairway to Galveston Whis Buoy.	Co. 305°	Dist.	108
	Total Distance		307 Miles.

Steaming Time @ 15 kts 20 hours 24 mins
Steaming Time @ 16 kts 19 hours 12 mins
Time difference between Louisiana & Texas

Course South standard each to; F.W.E. 2230 to 2215 Loaded 42 tons cargo No 4 trimmed, Soybeans (bags) steel bands, etc. 2355 S.B.E. Pilot; Capt. Whitten. Ms "Buchenbach"

Tuesday 23rd Sept 71 0005 All clear F & A. 0008 ½ swinging in river. 0019 Beg. away; 0110 Twelve Mile pt. 0124 English Town. 0230 Pavenly Pt. 0400 Sixtymile Pt. 0549 Pilottown, Mr. Burax on board. 0725 Pilot away. 0730 F.A.D.P. abeam of Sea Buoy.

Noon:- 28°-01'N 90°-13'W C.Vars. Dist 67' S.T. 4.5 Ln. Ab.Sl. 14.89 Lb. SE to E-4 Mod/Rem Sea; Mod Swell; Partly cloudy & clear. N.C. 5-5 Ins 2.0. C. 2 Ins. Revs 90; D x E 66', Slip negative. On 265° Course in fairway ½ nt south.

Friday 24th Sept 71 Oil rig encountered in fairway in Lon. 92° 32.5'W 93-23.5'W. Heavy traffic on 00-04 watch. Heald Bank buoy on station @ 11' & sighted visually @ 10'. Well (covered 38 ft.) R.B. Qk.Fl. (29°-06.5'N, 94-24W) was sighted.

N. Tex. to Panama Canal.

From Sea Buoy	Co. 125°	Dist. 113
Fairways to 27°-51' N 92°-34' W	" 143°	" 27
to Cabo San Antonio (Lg 090° x 10')	" 131°	" 542
C.S. Antonio to Quita Sueño Bk (270° x 10')	" 152°	" 504
Quita Sueño to Cristobal Breakwater.	" 169°	" 312
	Total Dist.	1498 Miles.

Alternative Route.

From Sea Buoy.	Co. 125°	Dist. 113
Fairways to 27-51' N 92°-34' W	" 143°	" 27
to Isla Contoi (Lg 230° x 10')	" 139°	" 493
I. Contoi to Quita Sueño (Lg 270° x 10')	" 143°	" 540
Quita Sueño to Cristobal Breakwater	" 169°	" 312
	Total Dist	1485 Miles.

Offside "Soundings" U.S. Pilot Chart for Nth Pacific, Nov. 1871

Positions:-

End of Fairway	27°-51' N	92°-34' W
Cabo San Antonio	21°-53' N	85°-08' W.
Isla Contoi	21°-35' N	86°-40' W.
Quita Sueño	14°-29' N	80°-58' W.
Cristobal Breakwater.	9°-23' N	79°-55' W.

Steaming Time (1498 miles) @ 12 knots. _____ 5 days 21 hrs 30 mins.

Steaming Time (1498 miles) @ 15 knots. _____ 4 days. 3 hrs 54 mins.

No Time Difference when Texas is on Summer (Daylight Saving) Time.

Arr. Galveston Tex. 24-9-'71. Breakwater light sighted at 15 miles. Pilot waved on V.H.F. on Ch. 12 about 16 miles from the breakwater, ladder on port side, 8 feet from the water. Numerous lights on ships at anchor made things a little confusing. 0430 hrs. E.O.P. Breakwater Lt. bearing 302° x 12'. Fm mean; Co. Vars. Dist. 257'; S.T. 16½ hrs. Av Sf. 15.57; Revs A.C. 24.0 Av. 0.9. 2 x E 257' Ship. Nil. Total Dist. 324'; T.S.T. 21 hrs. Total Av Sf. 15.43 knots. Wind E'ly 3/4, Mod. Sea & Lo. Swell; Partly cloudy & clear; ½ Rolling & Pitching easily. 0505 Pilot Mr. on board. 0527 Passing breakwater head. 0555 Let go starbd anchor. 0600 Brought up to starboard anchor, 3 shackles in the water, depth 32 feet; position:— Galveston Roads, breakwater light bearing 114°(T) x 2·9 miles. 0954 to 1005 Surveyors on board. 1615 Boat & fire drill. 2243 John Doyle (Sailor) taken ashore in U.S. Coast Guard vessel with suspected appendicitis.

Saturday 25th. Sept. '71. At anchor, Galveston Bay; the anchorage is tidal & ship swinging with the flood & ebb. Galveston Making Operator; V.H.F. Ch. 28.

Sunday 26th. Sept. '71. Everything was prepared for leaving at 0500; as we had been told by shoreside personnel; but the pilot did not materialise until 0947 — Mr. B. Mains. 1004 Anchor away. 1033 Approaching berth — tug "Potrose" in attendance. 1107 Alongside FAA; F.W.E. We were now tied up at a temporary berth (about 2 ships length from the grain elevator) port side-to. Here we had to wait for an American ship "Steel Apprentice" to complete loading & vacate the berth. When the time came to shift we had great fun. As half the crew & ours missing we could not just warp along but had to make it an engine shift. Shifting from 1942 to 2020. Some yo-yo player was directing operations on the quayside & we shifted ahead & astern & ahead, etc., to the amusement of everybody. Tug "Jennifer George" in attendance during the shift. Finally made fast; port side to; at "Elevator B" built in 1930, filthy, rat-infested, fly besieged, rotten piling, smelly hell-hole. Worked cargo (running 2 spouts at a time) night away until 2300 hrs. Bunkered in the

afternoon from a barge alongside.

Monday 27th Sept. '71

Resumed cargo @ 0700 hrs. one gang only in the morning and afternoon. Two gangs from 1900 hrs.

Tuesday 28th Sept. '71

Cargo finished and labour ashore @ 0130 hrs. Pilot: Capt. J. Smith on board @ 0550 hrs. Tugs "GRAMPUS" & "JENNIFER GEORGE" alongside.
*0624. Let go, vessel leaving berth. 0745 Pilot disembarks.
0800 F.A.O.P. Nº1 Buoy bng 320° x 2·2'. Draft on sailing -
(F) 28'-06" (A) 28'-02"
1134 hrs. reduced revs. to E/R requirements - shaft bearing overheating.
Noon :- 28°-43'N 93°-50'W Co. 125°, Dist. 50' St. time 4·0 hrs. Av. Sp 12·5. Av. Revs. 76·9; H.O. 4·5 D.O. 0·2. Dx Eng 50'; Slip Nil. Wind SE-4; Mod. sea & swell, cloudy & clear. A strong set towards the west was experienced when coming down the safety fairways. There were large numbers of fishermen & other small craft about. 19cc Log landed; it was fouled by cotton waste & gulf weed.

Wednesday 29th Sept. '71

Vessel still on reduced revs. due to overheating shaft bearing. Noon - 26°-10'N 90°-14'W Co. VARS. Dist. 253' St. time 24 hrs. Av. Sp. 10·54 kts. Revs. 73·5. H.O. 20·5 tons. D.O. 0·9 tons Dx Eng 286' Slip 13·04% Wind SE to ESE 3/5. Mod. Sea & Swell; Partly cloudy & clear. Spraying on foredeck.

Thursday 30th Sept. '71

Star sights this morning - vessel set approximately 20 miles to the SW of her course line. Noon: 22°-47'N 86°-38'W. Co. VARS. Distance 283 miles; St. time 24 hrs.; Av. Sp. 11·79 kts. ESE 3/4 Mod sea & swell, partly cloudy & clear. The position at noon more or less tied in with the morning star sights; it put us about 3 miles to the northward of the course steered since star sights. However, when Cabo San Antonio was picked up the vessel had this time set about 10 miles to the north of the course line - a great help for sets. Cabo San Antonio abeam on

radar @ 15½ ± was sighted visually @ 15 Approx.

Friday 1st. Oct. '71. Sta sights this morning - set a bit to the west. Noon sights set back a bit east. Current according to U.S. Pilot chart for Oct 71 given 0.8 knots against as D.R.'s of Swan Island (SWA - 407) & Grand Cayman, Owen Roberts (ZIY - 3144) were good & clear at daylight. Noon 18°-27'N 83°-08'W Co. Vars. 342° Dist. Av. Sp. 14.25 kts. H.O. 36·9 Tb D.C. 1·0 Tb. D & E. 375 Slip. 8·8% Wind SE to ENE - 3 Mod Sea & Low Swell. Partly cloudy & clear. No set was again to the westward at evening star sights. First soundings on the banks at 2049 hrs. The wreck on Farrell Rocks did not show on radar (Approx. 25 miles when abeam.) Oil rig sighted in position 16°-12'N 82°-06'W.

Saturday 2nd Oct. '71 No star sights this morning due to overcast. Abeam of lighthouse on Quita Sueño Bank @ 0730, it did not show on radar & was not sighted visually. Wreck on bank got on radar at 17'. Noon: 13°-35'N 80°-44'W; S.T. 24 hrs Dist. 323; Av. Sp. 13·46 kts. Co. Vars. H.C. 382 Loss; D.C. 1·1 Loss. Revs. 963 D & E. 375' Slip. 14·08%. Wind ESE to ENE 3-4; Mod sea & Low swell. Little traffic encountered 0944 to 0948 hrs. Heavy rain squall - clearing later. 16·5 knots & ¾ mile drill. No traffic in afternoon & evening.

Sunday 3rd Oct. 71 Three ships encountered on 00-00 watch this morning - one crossing (westbound). M.S.S. Isla Grande 107° x 26'. Isla Grande lt. sighted visually @ 21' on land in the vicinity of San Carlos Point showed on radar at approx. 22' but was indistinct & identity. Red lights on the many radio masts around Cristobal-Colon were sighted at over 20 miles. Toro Point lt. was sighted at 18 miles. Toro Pt. lt. usually shows up before the breakwater lights; and the radio masts usually show up before the loams of Toro & Breakwater lights. Strong set to the eastward experienced. When approaching Cristobal from the northward, if the light of Farallon Sucio is sighted, it would indicate that the vessel has set to the east as the light is red with a 10-mile range. 0624 E.O.P. E. BREAKWATER LT. brg 178° x 4' Distance since noon 253; Co. 169°T; S.T. 18·4. Av. Sp. 13·75 kts.

PANAMA CANAL TO CALLAO.

MIDWAY No 1 & SEA BUOYS TO TABOGUILLA (270° x 2')	Co. 155°	DIST	5
TABOGUILLA TO I& LA PLATA (095° x 6')	" 189°-37'	"	612½
LA PLATA TO PTA PARIÑAS (082° x 7')	" 185°	"	206
PTA PARIÑAS TO PTA FALSA (053° x 7')	" 172°	"	84
PTA FALSA TO LOBOS DE AFUERO (234° x 6')	" 144°	"	61½
LOBOS DE AFUERO TO I& MAZORCA (069° x 3¼')	" 148°	"	322
MAZORCA TO CALLAO (2' WEST OF BREAKWATER)	" 138°	"	32
			1343

STEAMING TIME @ 15 KTS. 3 DAYS - 17 HRS. - 30 MINS.
STEAMING TIME @ 16 KTS. 3 DAYS - 12 HRS. - 00 MINS.

Total distance 150m'; total steaming time 118¼ hrs. total av. speed 12·70 kts.
ARR. CRISTOBAL. The engines were tested; astern movements; before entering the breakwater. 0658 hrs ℄ entering off breakwater head. C'FOR Pilot:- Mr. A.E. Rainey & boarding officer on board. 0722 ℄ proceeds towards berth. 0759 ℄ coming alongside berth, tugs "CHESTER HARDING" & "JOSEPH C. MEHAFFEY" in attendance. 08:0 All fast F & A; F.W.E. ℄ berthed at Pier 16, south-west side, port side to. draft arriving 28-00" (F) 28-00" (A). Heavy oil & diesel oil loaded. (460 TONS) 1430 Prov. gear tested. 1505 Pilot, Mr J. Command on board, tugs "JULIAN S. SHELLEY" in attendance fwd. Draft sailing (F) 25-11" (A) 25-11". 1517 hrs. let go F & A; ℄ leaving berth & proceeding to anchorage. 1542 let go port anchor. 1547 ℄ brought up to port anchor, 3 shackles in the water. ℄ did not commence canal transit today because of problems with the distilled water for the boilr; remained at anchor overnight. Anchored position:- EAST BREAKWATER LT. brg. 037° x 1·43 miles. During the night, cluster lights were rigged over the side (on pilots advice) as the deck floodlights were not working.

Monday, 4th Oct. '71 1125 hrs. Prov. gear tested; 1127 Pilot, Capt. JOHN M. HOWE on board. 1150 Commenced heaving up anchor; 1156 Anchor aweigh

½ proceeds to Gatun Locks. 1227 Canal over on board. 1256 ½ entering first lock. It took on the average approx. 10 minutes to raise the water level in each chamber. 1345 ½ clear of Gatun Locks. The canal transit was made in daylight, sun very hot & no rain - in constrast to previous canal transits. Due to longshoremen's strikes in U.S. ports, the traffic on the canal was very light. Alligators were sighted on the bank in Gaillard Cut. 1645 hrs. approaching Pedro Miguel Locks. 1658 Entering Pedro Miguel Locks. 1716 Clear Pedro Miguel Locks, pass Station liner "ROSSINI". 1733 ½ entering Miraflores Locks. 1814 hrs clear Miraflores Locks. 1842 hrs. pass Hatchet Bridge 1905 hrs. Pilot away. 1918 hrs. F.A.O.P. Sea Buoy 350° x 0.3'. A set to the westward was experienced in the Gulf of Panama; speed over the ground in Gulf of Panama 14 knots although the revs were only approx. 90 r.p.m.

Sunday 5th Oct. '71. 0200 Cabo Mala bng 301°(T) x 17½' sighted on radar at 18 miles. Rain squalls in the morning. Noon:- 4°-56'N 80°-09'W Co Vges. 2nd dist. St. time 16.7 hrs. Rev. Sl. 143 knots; Revs. 30.7; M.E. 24.8 tons; 1.E. tons; M.E. Eng 2144; Slip. 2.05% Wind SSW 3/4; Baro 1013; temp 83(F) 28°(C); Sea temp. 27°(C) Wind sea & swell, ½ rolling & pitching easily, cloudy.

Monday 6th Oct. '71 Noon - 0°-17'S 81°-02'W Co Vges. Dist. 348' St. time 24.0 hrs. Ave. Speed 14.50 knots; Revs 95.1; M.E. 36.3 or 1.1 D x E 37.1 Slip 6.2% SW by S 3/5 Wind. sea & swell, ½ rolling & pitching easily, overcast & clear, Baro 1012 mbs. temp. 75(F) 24°(C) Sea. 27°(C) 1355 R. LA PLATA. bng 082°(T) x 5.1 miles. A had set slightly to the eastward when a landfall was made in the morning off Cabo Pasado & Cabo San Lorenzo. Pasado showed on radar (at 26'). No set encountered off R. La Plata this time, ship's speed over the ground 16 knots.

Tuesday 7th Oct. '71. 0230 hrs. C. Blanco bng 116°(T) x 11.8'. It was difficult to identify on radar. The lights around the oil tanks on the hill above C. Blanco were sighted visually at approx 13 miles. Many oil rigs as far as Pta. Pariñas. 0435 hrs. Pta. Pariñas bng 103°(T) x 9.8 miles. 1000 hrs. Pta Aguja bng 041° x 10.7' Noon:- 6°-22'S 81°-01'W Co Vges. S.T. 24 hrs. Dist. 341; Av. Sp. 14.21 Wind SSW 4/5. Rough sea & Mod/heavy swell; Cloudy & clear. Baro. 1014 mbs. temp. 65°(F) Sea 15°(C)

1500 Lobos de Afuera brg 230°(T) x 11·1', set to be westward, Afuera good radar target @ 24 miles.

Friday 8th Oct. '71 Noon:- 11° 04's 77° 59' W S.T. 24 hrs Dist. 335; Av Sp. 14·0 kts. Wind. SSW 4; Overcast with haze. temp. 66° F. Sea 62° F. Baro 1014 mbs. 1350 Isla Mazorca brg 064°(T) 3·0 miles, sighted usually @ 13 miles. no set experienced between the islands. Tanker also on his way to Callao rounded Isla Mazorca at about 0·8 miles. 1730 hrs. E.C.P. Punta Punta brg 144° x 3·4 mls. Total distance 1342 mls. Total steaming time 94·2 hrs Total av. speed 14·24 knots. 1753 hrs. Let go starboard anchor; officials board. 1810 ½ brought up to starboard anchor 30s in the water, position N. Breadwater head bearing 114°(T) x 9·5 cables. St was Navy day today; naval vessels at anchor were dressed overall & outlined in lights at night; a gun salute was sounded at sunset.

Saturday 9th Oct. '71 1120 hrs. P.O.B. Mr. Nugent. 1200 Shortened cable, waiting for other vessel to clear breakwater entrance. 1240 Anchor aweigh, 1254 hrs ½ past breakwater entrance, 1305 tug "Bellavista" in attendance. 1319 Lines ashore. 1330 Rlt. foot fore & aft, F.W.E. vessel berthed port side to at Muelle Marginal, Callao. 1345 hrs. Labour on board, preparing. 1415 Commenced discharging. The quay is fitted with two grain elevator towers, rate of discharge is about 100 tons per hour - worked until 2400 hrs. Draft on arrival 26-05" 25-04"

Sunday 10th Oct. '71 Worked cargo from 0715 to 2337 hrs. ⅛, 3/16, ⅛, 3/16 mile ½ ½ nine on a tour of Lima & surrounding countryside.

Monday 11th Oct. '71 Worked cargo from 0715 to 2355 hrs. Boat & fire drill today, port & stbrd boats lowered out.

Tuesday 12th Oct. '71 Worked cargo from 0110 hrs. and around the clock from then on.

Wed. 13th Oct. '71. 0135 Ship's gangway was struck by grain elevator while gantries were being moved. Bunkers were shifted during the day from m.v. "PORT COSTA" (PETROPERU). Completed discharging cargo for Callao @ 2258 hrs Labour ashore 2315. 2348 Pilot:- Capt. A. PUJAZON on board.

Thurs. 14th Oct. '71 Sailing CALLAO. 0005 hrs. Singing up F & A Tug "Villavista" fast aft. 0014 Let go F & A. 0027 ½ clear of berth. Breakwater abeam 0040 hrs. The pilot disembarked inside the breakwater. Misty conditions were experienced off Isla San Lorenzo; the small fishing vessels were a nuisance. 0100 hrs. F.A.O.P. PUNTA PUNTA bng 120° x 4' Palomanias, Pta. Salas, Ia. Pachacamac & Pta Chilca were good radar targets but the rest of the coast as far as Grupo de China was very poor. China showed up at 20 miles. San Fallan showed up clearly at 36 miles. 0930 hrs. SAN GALAN bng 118°(T) x 7' 1130 Pta Cametas bng 074°(T) x 5.6' ½ a set experienced off Bahia Independencia. Posn:- 14°-20'S 76°-18'W. S.T. 11.0 hrs. Dist. 153' Av. Sp. 13.91; Revs 85; Ship Nes. SSE-½; Slight sea & Wind/heavy swell; Overcast with haze. Sta Inspiracion seen visually at 12 miles (black & conspic.) 1345. Dona Maria bng 084°(T) x 5.1'. Land south of Dona Maria very confusing. C. Nazca was good, as were Santa Cruz & Nicholas. Pta Lomas was amiss. 1730 Pta Parada bng 047° x 8.0'. The coast between Pta de Chala & Bahia de Atico as charted does not coincide with the configuration seen on radar. Pta Atico radar conspic but light not seen. Pta Parachoque to Pta Camana very poor - no set experienced. Pta Atico bng 084° x 9.8' @ 2300 hrs.

Friday 15th Oct. '71 Some fishermen encountered in the morning, heavily overcast and haze; wind ESE ¾; Slight sea & Wind/long swell.

MOL MATHRANI E.C.P. @ 0650 hrs Pta Salinas bng 112° x 4½ mls. C. JARS dist 29.5, S.T. 18.5 hrs. Av. Sp 15.83. Revs 97.4. TOTAL DIST. 446' TOTAL ST. TIME 29.5 hrs. TOTAL AV. SP. 15.11 kts. 0507 hrs. Pilot - Mr. Luis Romero & officials on board. 08.5 tugs "TAMBO" & "MAJES" in attendance, found tug picked up the ships' towing spring and then just let it go again - a similar occurrence happened on our previous visit to this port. 0825 hrs. passing breakwater entrance, entering harbour. 0832 hrs. ½ swinging in harbour. 0850 Alongside & making fast. 0855 hrs. F.W.E. berthed in the same berth as last time, inwards most berth, starboard side to. 0900 hrs. Labour on board - preparing; there is one grain elevator here (2 pipes). 0941 hrs. Commenced discharging. 1650 Ceased work for the day. It rarely rains in Matarani (hatches were left open at night) but there was rain recently which

caused damage to the local generating plant – the grain elevator was unable to work at night due to reduced electrical power. Draft on arrival: F. 16'-06" A 18'-01"

Saturday 16th Oct. '71 & Subsq. Elevator breakdown from 0820 hrs. to 0936 hrs and from then on only one pipe working due to reduced power. Ceased @ 1645 hrs. On Sunday one elevator pipe only was working in the morning. Bagged coffee was loaded in No 2 tweendeck reefers. A football match was played with a team from the British ship "SIR RAGNE" – it was a draw. Completed grain discharge on monday & commenced loading lead concentrate on tuesday – ship's gear was used. The ore was brought on to the quayside in trucks in steel tip-buckets (3 or 4 to a truck);- these were lifted on board and then tipped over in the hold,- 1830 to 2030 Winch breakdown at No 2 fwd, alternative arrangement (using No 1 starboard derrick rigged up). Worked until 2346 hrs. on tuesday. Worked range on Wednesday from 0815 hrs to 24.00 hrs. – frequent short delays during the day waiting range delivery by trucks.

Tuesday 21st. Oct. '71 loading range from 0035 hrs. until completion @ 0620; bulldozer lifted ashore, beams shifted. 0820 Labour ashore. 0830 Pilot L. Romero on board. SAILING: MATARANI Draft F 20'-00" A 20'-06" 0839 S.B.E. Singling up. tugs "THOR" & "MARES" alongside. 0845 hrs. Let go F & A. 0859 ½ Clear of breadwater. 0903 hrs. Pilot disembarks. 0918 F.A.C.P. PARKLAY 297° x 3' 1000 hrs. C. SAMANA abeam by S. 5½'. Noon:- 16°-45's 71°-50'w S.T. 2.7 hrs. Bar.Sp. 15.19 Bar 1016 mb. Temp 73°(F) 23°(C). Sea 62°(F) 17°(C) Wind SSW ½, Low Swell, overcast with haze. 1556 hrs. Pta Salinas bng 032°(T) x 8'. 2200 hrs. Pta Parada 017°(T) x 9'.

Friday 22nd Oct. 71 Little or no inshore-offshore set experienced on the coast. Peru current behind us – Sea temp. 61°(F) 16°(C) Condition were mostly hazy; a lot of fishermen about. 0546 San Gallan (observed by haze) 065°(T) x 4.0 mls. Noon:- 12°-23's 77°-18'w S.T. 24 hrs. Run. 16.04 Mls. Dist. 385' Revs. 98.5. Wind SE to SSW ½ Smooth sea & low swell. Set inshore south of Mazorca & offshore when northward – island sighted visually in haze at 10 miles – some traffic encountered. 1630 hrs. I. MAZORCA 133° x 9.3'

Tuesday 23rd Oct 71. Heavy fishermen were encountered when abeam of Chimbote – many without lights – very poor radar targets. Gonfo de Guanape showed up on radar at 24 miles, and the light was seen visually at 7 miles in haze. 0300 hrs. Isla del Sur bg 063° x 6'.
ARR. SALAVERRY. 0412 hrs. E.O.P. Salaverry breakwater bg 029° x 6.0'. Dist. 267'. S.T. 16.2 hrs. Av Sp. 16.48 kts. Revs. 98.6. Wind SSE 3/4 Slt. sea & low swell. Total dist. 693' T.S.T. 42.9 hrs. Total av. speed 16.15 kts. 0452 Let go starboard anchor; 0453 ½ Brought up. to 3 shackles in the water – position Breakwater head bg 103°os x 1.05 miles. Draft on arrival 19'-00" F. 18'-06" A. 0710 P.C.B. 0719 Commenced heaving anchor. 0727 Anchor aweigh 0750 Appr. bell. 0754 Let go port anchor, one shackle in the water. 0801 Lines ashore F & A tug "Salaverry" in attendance. 0809 F.W.E. ½ berthed at the north-east side of pier No 1, head inwards (S.E.). The wharf is open with rail tracks laid on but the railway (to Trujillo) is no longer in existance. The SW side of pier No 1 is fitted with a pipeline for load molasses; Pier No 2 is similar to No 1 but the SW side is fitted with a conveyor & two gantries for loading of bulk sugar, fishing vessels lie up on the NE side of pier No 2. The fendering on the pier is good, fresh water in hard on. A heavy swell rounds around the head of the breakwater and runs in on the piers; – it seems to be worse at night. 0818 hrs. rigged on board – for sea. 0950 to 1300 Wind breakdown at No 1. Commenced loading load of coffee concentrates at 0955 hrs. In this hold the ore was brought on the wharf by trucks in bulk and was dumped in a large heap on the quayside; rectangular metal buckets were then filled by shovel-tractors. The buckets were lifted on board by the ship's gear and were tipped over at tweendeck level. This operation was slow, cumbersome and dusty filthy – the black dust was blown all over the ship's paintwork & was carried throughout the accommodation. Alternative arrangement for working No 1 hatch, (using starboard derrick No 2) was used in the afternoon. 1732 to 1814 hrs. Wind breakdown at No 1. Worked cargo that night until 2248 hrs.

Sunday 24th Oct. 71 Much commotion shortly after midnight, C. Moore 3/e fell between ship & quay when returning from shore – he was speedily fished out & was none the worst for the experience. Worked cargo 0745 to 2250 hrs. Cargo runner handed at 1200, this morning 1106 to 1500 hrs. Steam out of place at 1300 3 & refitted by shore riggers 1550 to 1730.

Monday 25th Oct 71. Worked cargo 0735 to 2250 hrs. & on tuesday from 0745 to 2255 hrs. Suction dredge "Ufirial dottir Landa" arrived to begin dredging the entrance channel where silting has occurred.

Wed. 26th Oct. 71 Completed loading cargo 1900 hrs; ship beams etc; labour ashore 2045. P.O.B. McAlexander @ 2115 hrs. John English 3/e & Fergus Foley E/c failed to return from shoreside before sailing. 2216 Let go. 2217 Clear of berth. 2245 Pilot away. 2306 F.P.O.P. Breakwater Lt. 101° x 2½' Mooring lines spotted 16 times during the vessels stay in port, the smell being at its worst an hour before sailing – just as well we left when we did. Mooring were tightened up each morning & evening. Draft sailing = 25-00" & 24-06.

Thursday 26th Oct. 71. Constitans on the barcaza from Salaverry to Guayaquil were very baggy – a lot of fishermen about. Sas. Macabi showed on radar at 16 miles & the light was seen at 7' in haze. 0700 Lobos de Afuera bng 209 x 1'.8 1024 Lobos de Tierra bng 084° x 12½' 1100 Pta Falsa bng 055° (T) x 1'. Draft:- 6'-0" F 8'-7" S 8'-16" A S.T. 12-8 hrs. Dist. 190' Av Sp. 14.73. Revs 92.6 M.E. 15.5; Dec 0.7 Slip 2.06%. Wind S'ly 3, Slight sea & mod. swell; overcast with haze. 1722 Pta Parinas 083° x 9½' 19.5 Cabo Blanco 110° x 8.4'

Friday 29th Oct. 71 0000 hrs. h. Station Clock bng 070° x 22.5 mls. The approach to Guayaquil pilot was very difficult – the visibility was reduced by mist & numerous fishermen were a menace – some were fishing in the middle of the entrance channel – the Alolis lamp showed no sign of life on board these fishing vessel – obviously they had all turned-in. Could not recieve the pilot station on V.H.F. 0230 hrs. E.O.P. Pta Paidras 027° x 9'; 0342 Sea Buoy abeam to port. Total Dist 407' T.S.T. 27.4 hrs. Total Av Sp. 14.85 knots. Pilot boarded between N°s 1 & 3 buoys.

Dec. Guayaquil. 0355 hrs. P.C.B. T. Alvarez, ½ forereds upriver. 0747 Let go starboard anchor. 0810 ½ brought up to 3 shackles in the water, position off No 72 Buoy. 0835 P.O.B. Mr Almeida Commenced heaving anchor. 0858 Anchor aweigh. 1027 Tugs "Tiburon" & "Torito" in attendance. 1044 Lines ashore. 1050 All fast F&A; F.W.E. ½ berthed at Dodega No 5, Puerto Marítimo, port side to. Board of Trade gangway used due to rise & fall of tide (about 10-11 ft.). Labour on board at 1330 hrs preparing. 1350 hrs. Commenced loading coffee & cocoa No 3 & 4 reefers. 1800 to 1900 meal interval. Thieves were on the rampage all day, radios & other good were stolen from cabins; loose moral ed ladies ply their trade after dark. A rated over the stern has to be light for ranges when testing the steering gear & wrong-way alarm.

Tuesday 30th Oct '71 Sail Guayaquil. Completed loading at 0007 hrs. 0009 hrs. Pilots Mr. Almeida & Mr. North on board tugs "Torito" & "Torredo" in attendance. 0043 hrs. singled up & tugs fast (ship's lines) 0044 hrs. Let go aft. 0045 hrs. Let go fwd. 0048 ½ Clear of berth. 0102 Dock pilot disembarks - tugs away. 0145 Abeam Pta Samper. 0332 Abeam Roca Seiba. - misty patches on the river. 0435 hrs Pilot disembarks in launch "Gloria" between No 3 & 5 buoys. 0512 F.A.C.P. Sea buoy 090°(T) x 1·0'. 0520 Pta Carnero bng 044°(T) x 8·5' 1134 hrs Pta Santa Elena bng 137°T. x 13·2'. Noon:- Lat 2°-50's 81°-10'W Dist. 73' S.T. 6·8 hrs. Av Sp 10·73 knots (Steaming on One Boiler - Leaking Steam Glands) Wind SE/SSE 2-4; Wind: rough sea & swell, Overcast. 1530 hrs. Isla Plata bng 090°(T) x 4·2'. Ldg Punta. E.O.P. @ 1836 hrs. Manta breakwater lt. bng 134°(T) x 1·8' Total dist. 140 miles, T.S.T. 13·4 hrs. Total hrs. Speed 11·12 knots. Wind SSW to SSW 3/4 Mod sea & swell; heavily overcast & clear. 1906 Pilot, M. Rodriguez on board. 1920 Aftr. berth. 1925 Let go fwd anchor. 1932 Lines ashore fore and aft. 1936 Alongside and making fast. 1945 All fast, F.W.E. ½ berthed starboard side to on the south side of the pier, a Dutch ship was berthed on the north side.
Loading cargo from 2030 to 2355 hrs. the ordinary hatchsparings were used - little swell.; the quayside is high so the B.O.T. gangway was used.; fresh water was laid on the pier.

Monday 31st Oct. 71 SAN MANTA. Draft. 25-05 26'-05" 0030 Singling up fore & aft. 0055 Let go. 0056 Clear of berth. 0110 Pilot disembarks. 0118 Lwo. F.A.O.P. MANTA BREAKWATER LT. bng 142(T) x 1·0'. The harbour entrance is good & clear, an easy place to enter & depart from. The lights of Manta were visible for 16 miles, as was the light on San Mateo.

ITALANI TO SALAVERRY.

BREAKWATER ENTRANCE TO PTA CORNEJO (023° x 5·5')	Co. 282°	DIST.	12 MILES
PTA CORNEJO TO PTA ATICO (032° x 9·0')	293°	"	91 "
PTA ATICO TO PTA PARADA (047° x 8·5')	302°	"	103 "
PTA PARADA TO PTA DONA MARIA (054° x 5·0')	317°	"	60 "
PTA DONA MARIA TO PTA CARRETAS (061° x 5·0')	324°	"	36½ "
PTA CARRETAS TO I^A SAN GALLAN (068 x 5·0')	331°	"	24 "
SAN GALLAN TO MAZORCA I^A. (069 x 3½)	334	"	164 "
MAZORCA TO GUAÑAPE (ISLA DEL SUR) (066° x 6·0')	336	"	184 "
ISLA DEL SUR TO SALAVERRY (1' WEST OF BREAKWATER)	005	"	23½ "
			698 "

STEAMING TIME @ 16 KNOTS. 1 DAY 19 HRS 36 MINS.
" " @ 15½ " 1 DAY 21 HRS 00 MINS.
" " @ 15 " 1 DAY 22 HRS. 36 MINS.

SALAVERRY TO GUAYAQUIL.

CLEARING TO CLEAR ROCK PIERS.	Co. 290	DIST	19 MILES.
ISLA MACABI (035° x 5·0')	311	"	25 "
MACABI TO LOBOS DE TIERRA (045 x 5·2')	315	"	116 "
LOBOS DE TIERRA TO PTA FALSA (053 x 7·0')	323	"	33 "
PTA FALSA TO PTA PARINAS (082 x 7·0')	352	"	84 "
PTA PARINAS TO CABO BLANCO (100 x 7·5')	010	"	25 "
CABO BLANCO TO SEA BUOY.	032		108 "
			410 "

STEAMING TIME @ 16 KNOTS 1 DAY 1 HR 36 MINS.
" " @ 15½ " 1 DAY 2 HRS 24 MINS
" " @ 15 " 1 DAY 3 HRS 18 MINS.

Guayaquil to Manta, Ecuador.

From Sea Buoy to Sea	Co. 270°	Dist	10 miles
to Pta Ancon (032° x 10')	303°	"	30 "
Pta Ancon to Pta Santa Elena (090° x 10')	326	"	19½ "
Pta Santa Elena to Ia. La Plata (090° x 5')	000	"	55½ "
Ia. La Plata to Cabo San Lorenzo (126 x 5')	036	"	19 "
Cabo San Lorenzo to Cabo San Mateo (326 x 3')	050	"	9½ "
Cabo S. Mateo to Manta (1 mile North Breakwater)	090	"	8½ "
	Total Dist. From Sea Buoy.		152 "

Steaming Time @ 16 Knots. 9 hrs 30 mins.
" " @ 15½ " 9 hrs. 48 mins.
" " @ 15 " 10 hrs. 12 mins.

Manta Ecuador - to Long Beach, Calif.

Manta Breakwater to Cabo San Lucas (Cabo Falso 040° x 18½')	Co. 309°	Dist.	2238 miles
San Lucas to Cabo San Lazaro (045° x 15')	313	"	175 "
San Lazaro to Ia Benito (051° x 8')	321	"	277 "
Benito to "LB" Buoy (270° x 0.25)	333	"	353 "
San Lucas to "LB" Buoy (805 miles)			3043 "

Manta (½ North Breakwater) Lat. 00° - 55' S Lg. 80° - 42' W
San Lucas (040° x 18½') Lat. 22° - 38' N Lg. 110° - 11' W
San Lazaro (045° x 15') Lat. 24° - 38' N Lg. 112° - 30' W
Ia Benito (051° x 8') Lat. 28° - 14' N Lg. 115° - 43' W
"LB" Buoy (270° x .25') Lat. 33° - 43' N Lg. 118° - 11' W

Steaming Time @ 16 Knots. 7 days 22 hrs 12 mins.
" " @ 15½ " 8 days 4 hrs 18 mins.
" " @ 15 " 8 days 10 hrs 54 mins.

Time Zones :- Ecuador G.M.T - 5 hours.
California G.M.T - 8 hours.*

* California keeps Daylight Saving Time (G.M.T. - 7 hours) from the Last Sunday in April to the Last Sunday in October.

Sunday 31st Oct. '71. Noon:- 00°-35'N 82°-29'W Co 310°(T) Dist. 140' S.T. 10-7 hrs. 13.08 knots. Revs 82·1. H.O. 13·6 tons. D.O. 06 tons. Diff E 1145'. Slip. 3·44% Wind SSW 3/4, Slight sea & low swell, mainly overcast, clear; temp. 81°(F) 27°(C). Sea temp. 78(F) 25·5(C) Baro 1012 mbs. No traffic. Clocks G.M.T. -5 hours.

Monday 1st Nov. '71. Noon:- 04°-12'N 87°-06'W Co 308°(T) Dist. 353' S.T. 24-5 hrs Av Sp. 14·41 kts. Revs. 95·5. H.O. 36·0 tons D.O. 1·2 tons. Diff E. 350' Slip. 7·10% Wind SW 3/4 Mod. sea & Mod/low swell, mainly overcast, clear, temp. 85°(F) 28½(C) Sea temp. 78(F) 25·5(C) Baro 1010 mbs No traffic. Clocks G.M.T. -5½ hours.

Tuesday 2nd Nov. '71. Noon:- 07°-50'N 91°-35'W Co 309° Dist. 346. S.T. 24·5 hrs Av Sp. 14·12 kts. Revs. 97·3, H.O. 36·0, D.O. 1·3 tons. Diff E 338' Slip. 10·82% Wind SW 4/5 Mod Sea & swell. mainly overcast, rain at times. temp. 78(F) 25½ (C) Sea temp 79°(F) 26° (C). Baro. 1011 mbs. No traffic. Clocks: G.M.T. - 6 hours. Porpoises sighted.

Wednesday 3rd Nov. '71. Noon: 11°-24'N 96°-23'W Co 307. Dist. 357. S.T. 24·5 hrs Av Sp. 14·57 kts. Revs. 98·4. H.O. 38·2, D.O. 1·4 tons. Diff E 392' Slip. 8·93% Wind W-NW 5/6 Slight sea & Mod/Heavy swell, mainly cast & clear. temp 87°(F) 30½(C). Sea temp 29½(F) 83 (C). Baro 1010 mbs. No traffic. Clocks - G.M.T - 6½ hrs. porpoises, flying fish. Set S.W.

Thursday 4th Nov. '71. Noon: 15°-23'N 101°-20'W. Co. 309½. Dist. 376'. S.T. 24·0 hrs. Av Sp. 15·67 kts. Revs. 28·3, H.O. 38·6 tons D.O. 1·3 tons. Diff E 388' Slip. 3·09% Wind N-NW 2, Slight sea & low swell, lovely cloudy & clear. temp. 87° (F) 30½ (C), Sea temp. 84° (F) 29° (C). Baro 1011 mbs. Clocks - G.M.T. - 6½ hrs. Set at noon again SW. One ship & a fisherman encountered on 20-24 metal. - ship called "SLOTERMERK" from Yokohama to Panama.

Friday 5th Nov. '71. Noon:- 19°-17'N 106°-09'W Co. 310° Dist 363' S.T. 24·5 hrs. Av Sp. 14·82 kts. Revs 100·1, H.O. 40·1 tons D.O. 1·2 tons. Diff E 389'. Slip 9·04% Wind NW'ly 3, Slight sea & low/mod swell, Cloudy & clear. temp. 85° (F. 29½ (C) Sea temp 82½ (F) 28° (C) Baro 1011 mbs. Clocks G.M.T. - 7 hours. Set at noon SW'ly again. A few ships seen later on in the day.

Saturday 6th Nov. '71. Landfall this morning off Cabo San Lucas. The land showed up on the radar at 46 miles. 0520 hrs. Cabo Falso Lt. bo. 328° x 36·5' ½ land abt 6 the eastward when landfall was made. The visibility was remarkably good - the peaks of Santa Genoveva & El Picacho showing clearly. Traffic from time to time during the day, including a tug with a large barge and a yacht. Noon:- 23°-21'N 109°-58'W Co. 312, Dist. 364, S.T. 24·5 hrs. Av. Sp. 14·86 kts. Revs. 100·6. H.O. 39·7 tons, Do 1·4 tons, Diff E. 401', Slip 3·22% Wind NW & W 3,

Slight sea & low swell; Clear, temp. 80° (F) 27° (C) Sea temp. 79° (F) 26° (C) Baro 1013 mbs.; Clocks G.M.T. - 7½ hrs. Boat & line still at 1615 hrs. 1930 hrs. Cabo San Lazaro bng 068° x 15.7 miles. Beautiful sunset due to the crystal clear visibility.

Sunday 7th Nov '71. Some ships from time to time — grand clear visibility. Table Mt. (1327 Ft.) was visible on radar at over 30 miles but gave only an approximate position using the 1000 Ft. contour as baseline. Isla Asuncion was identifiable at 21 miles from southwards. Inshore set experienced between Isla San Roque and San Benito. Noon: 28° 04'N 115° 33'W Co Vars. Dist. 378. S.T. 24 Hrs. Av Sp. 15.43 kts. Revs. 100·8. H.O. 38·0 tons; D.O. 1·3 tons. DxE. 402' Slip. 5.96%, Wind NW x N 5/6, Mod Sea & low Swell. Partly cloudy & clear, temp 65°½ (F) 18°½ (C) Sea temp 64½ (F) 18 (C) Baro 1016·8 mbs. Clocks G.M.T. - 8 hours (California). Small fishing vessels encountered off San Benito. Isla San Martin showed on radar at 28 miles, as did Cabo Colnett. 1300 hrs. Isla San Benito bng 065° (T) x 7·8 miles.

Monday 8th Nov '71 Small fishing vessels encountered off Cabo Colnett & flag towing a barge, strong inshore set. Pta. Santo Tomas showed on radar at 27 miles. Conditions were hazy in the morning when approaching San Pedro Bay. A number of naval vessels & many small craft were encountered. Noon:- 33-27'N 118-04'W. Co Vars. Dist. 352', S.T. 24·0 hrs. Av Sp. 14·67 knots. Wind NW x Master Sea, Low Swell, Haze. Revs 99 H.O. 37·3; D.O. 1·4, DxE 38·6; Slip 8·8%.

Pier Long Beach E.C.T. 0 1300 hrs "LB" Buoy bng 337° x 3; Total St. Time 206 7 hrs. Total Dist. 3,043 mls. T.H.S. 14·72 kts. Draft (F) 26-06 (A) 26-06. Pilot, J. N. Cormier boarded at 1313 hrs. off the "LB" buoy. Lines were unshifted from No's 2 & 5 batches when the vessel was inside the breakwater & before arrival at the berth. 1353 Tug "Seal Beach" in attendance. 1406 Ships berth. 1412 Lines ashore. 1419 All fast, F.W.E. No cargo was worked due to labour shortage. Berth D-31, port side to.

Tuesday 9th Nov '71 Very thick fog in the morning & evening. No gangs available during the day; - 2nd Mate accompanied the 2 Deck Cadets on a tour of the liner "Queen Mary". One night gang commence discharging @ 2010 hrs. Discharging was by means of shoreside cranes using grabs, the ore being loaded onto railroad wagons. Grabbers taken from Norge 1330 to 1730 hrs.

Wednesday 10th Nov '71 Fog again in the morning & evening. No day gangs, one gang at night from 1800 hrs.

Thursday 11th Nov '71 Discharging from 0830 hrs. Fog in the morning & rain in the evening. Crane breakdown 1440 to 1450 hrs.

Friday 12th Nov '71 Day & night gangs available - a lot of rain at night & in the early morning. Discharging now at bat slower as the grabs have to wait for cargo to be brought to the square of the hatch by bulldozers. 1900 to 2045 hrs. no cargo discharged - crane driver not available.

Saturday 13th Nov 71 No day gangs due to labour shortage. One night gang from 1800 to finish at 2055 hrs. Draft sailing (F) 17-09" (A) 24'-10"

SAIL LONG BEACH. 2115 Nav gear tested. 2150 Pilot - T.V. ALBRIGHT on board. Tug "Terminal Island" in attendance. 2153 S.B.E. Singling up. 2203 Let go F & A. 2228 Clear of breakwater. 2233 Pilot away. 2236 F.A.C.P. @ "L B" buoy. 2300 Pt. Fermin bug 322°(T) x 15'. Passage was made south of the Santa Barbara Channel - very little traffic encountered.

Sunday 14th Nov 71 0830 South Pt. bug S.3 x 3.1' 0710 Speed reduced to 85 R.P.M. to save weather pitching. 0730 West Point San Miguel 022° x 6' 0742 Red. to 80 R.P.M. 1045 Red. to 70 R.P.M. Pos'n - 34°-37 N 120°-56 W, S.T. 13th hrs. Limit 16' Lt Sp. 12.90 KNOTS Limit 11 1/4" 7/8; Through sea & heavy swell; Partly cloudy; Clear. H.O. 160 DO. 0-4; Revs. 84 - 2. 2 1/2 E 18 M, Slip 12.0% 1830 Pt. Piedras Blancas bug 031 x 1M. 2330 Pt. Sur bug 014 - 9M

Monday 15th Nov '71 ARR. SAN FRANCISCO 0807 S.B.E. The San Francisco lightship has been replaced by the buoy "SF" buoy (Fl. 2sec. 12M) 0812 E.O.T. SF buoy bng 289°(T) x 1M E. T.S.T. 35-6 hrs. T. Dist. 368' T.A.S. 10-85 KTS. Relief pilot cutter on station (yacht-like appearance, painted white) PILOT - Mr HART on board. 0906 Golden Gate bridge. 0917 Local pilot, Capt. Davies on board; tug "KELLY MAHONY" alongside. 0929 Approached berth in strong off-berth wind. 0945 Making fast. 0948 F.W.E. Settled port side to at PIER 45 a. near Fishermans Wharf. Dr. arr. (F) 17'-10" (A) 24'-06" No cargo worked today due to labour shortage.

Tuesday 16th Nov '71 Fine & clear day - no cargo worked today due to labour shortage.

Wednesday 17th Nov '71 No day gangs - 2 gangs at 1900 hrs. commenced to discharge coffee & cocoa from Nos 3 & 4 tweendeck reefers.

[illegible] Beach to San Francisco

via Santa Barbara Channel Traffic Separation System.

"B" Buoy to "LA" Buoy (335° x 0.5')	Co.	245°	Dist.	3 miles.
"A" Buoy to Point Fermin (000° x 1.1')	"	263°	"	3 "
Pt. Fermin to Vicente Pt. (030° x 4.0')	"	270°	"	8 "
Vicente Pt. to Huenene Pt. (063° x 6.0')	"	300°	"	50 "
Huenene Pt. to Conception Pt (014° x 5.5')	"	285°	"	61 "
Conception Pt. to Pt. Arguello (040° x 5.0')	"	310°	"	14 "
Pt. Arguello to Pt. Sur (059° x 5.0')	"	329°	"	122 "
Pt. Sur to Pigeon Pt. (068° x 3.0')	"	338°	"	58½ "
Pigeon Pt. to "S.F." Lt. Hse Buoy (270° x 0.75')	"	343°	"	36½ "
			Total Dist.	356. "

Steaming Time @ 16.00 Knots. 22 hours 15 mins
" " @ 15.50 Knots. 23 hours 00 mins
" " @ 15.00 Knots. 23 hours 18 mins.

South of Santa Barbara Islands.

"B" Buoy to "LA" Buoy (335° x ½')	Co.	245°	Dist.	3 miles
"A" Buoy to Pt Fermin (011° x 1.1')	"	263°	"	3 "
Pt. Fermin to Pt Vicente (030° x 4.0')	"	270°	"	8 "
Pt. Vicente to South Pt. Santa Rosa (006° x 4.0)	"	276°	"	84 "
South Pt. to 1st L Bennet Point Light (024° x 32')	"	294°	"	20 "
1st L Buoy to Point Sur (059° x 5.0')	"	332°	"	156 "
Point Sur to Pigeon Pt (068° x 3.0')	"	338°	"	58½ "
Pigeon Pt. to "SF" L-Hse. Buoy (270° x 0.75')	"	343°		36½ "
			Total Dist.	369

San Francisco to Tacoma.

"SF" Lt. Ho. Bouy (0.75 NE.) to Point Reyes	035 x 2.3'	Co. 305	Dist 21	miles
Pt. Reyes to Pt. Arena	(057 x 5.0')	" 327	" 68	"
Pt. Arena to Blunts Reef.	(069° x 4.0')	" 339°	" 97	"
Blunts Rf. to Cape Blanco	(088° x 6.0')	" 358°	" 145	"
Cape Blanco to Umatilla Lt. V.	(090° x 2.0') (Co. 358-37')	359°	" 320	"
Umatilla Lt. V. to Cape Flattery, Tatoosh Is	(090 x 5')	" 005°	" 14	"
to Tatoosh Is	(180 x 5')	" 045°	" 7	"
Cape Flattery to Ediz Hook	(180° x 1.5')	" 109°	" 56	"
Ediz Hook to Pilot Stn., Port Angeles.		" 160°	" 2	"
	Total Dist. (Pilot to Pilot)		730	"

Inland Pilotage from Port Angeles to Tacoma, via Admiralty Inlet & Puget Sound = 85 miles Approx

Umatilla Lt. Vl. Lat. 48°-10'N Long. 124°-53'W Course 358°-37'

Cape Blanco. Lat. 42°-50'N Long. 124°-42'W Distance 320 miles.

Steaming Time @ 16 knots. 1 day 21 hrs 36 mins.

" " @ 15½ knots. 1 day 23 hrs 06 mins.

" " @ 15 knots. 2 days 00 hrs 42 mins.

Tacoma Wash to Powell River B.C

Inland Pilotage — Dist. 123 Miles.

U.S. Pilot From Tacoma to Lime Kiln

Canadian Pilot from Lime Kiln to Powell River.

Powell River to Coos Bay Or.

		Co Vars.	Dist 130° Approx.
Powell River to Victoria (Pilot Station)			
Victoria Fairway Buoy to Race Rocks	(296° x 2')	206°	" 6½ Miles
to Race Rocks	(026° x 2')	250°	" 3 "
Race Rocks to Tatoosh Is.	(180° x 5')	285°	" 48½ "
to Tatoosh Is.	(090° x 5')	225°	" 7 "
Tatoosh Is to Umatilla ¼	(090° x 2')	185°	" 14 "
Umatilla ¼ to "K" Buoy	(270° x .25') (175°-50')	176°	" 289 "
	Total Distance (Pilot to Pilot)		368 "

Steaming Time @ 16.00 Knots. 23 hrs. 00 mins. Umatilla: 48°-10'N 124°-53'W

" " @ 15.50 Knots. 23 hrs. 48 mins. "K" Buoy: 43°-22'N 124°-23'W

" " @ 15.00 Knots. 24 hrs. 30 mins.

Coos Bay, Or. to San Francisco

"K" Buoy to C. Arago, South Cove Pt. (130° x 3')	Co. 240°	Dist	4 Miles.
C. Arago to Cape Blanco (88 x 6.0')	" 200°	"	32 "
C. Blanco to Blunts Reef (069° x 4.1')	" 178°	"	145 "
Blunts Reef to Pt. Arena (057 x 5.0')	" 159°	"	97 "
Pt. Arena to Reyes Pt (035 x 5.6')	" 150°	"	69 "
Reyes to "SF" Buoy (SW x .75') via Traffic Sepn. Zone	" 120°	"	21 "
	Total Dist		368 "

Steaming Time @ 16 knots 23 hrs 00 mins.
" " @ 15½ knots 23 hrs 48 mins.
" " @ 15 knots 24 hrs 30 mins.

San Francisco to Salaverry

SF" Lighthouse Buoy to Separation Zone Buoy	Co. 190°	Dist.	5 miles.
Sepr. Zone Buoy to End of Separation Zone	" 169°	"	12 "
Sepr. Zone to Pt. Sur (066° x 4.2')	" 156°	"	77 "
Pt. Sur to 11th Bennett Pt. Buoy (065° x 4.8')	" 153°	"	155 "
11th Buoy to Isla Benito (051° x 8.0')	" 144°	"	426 "
Is Benito to Cape San Lazaro (CMS° x 15.0')	" 141°	"	277 "
Cape San Lazaro to Pt. Hueneme (CMS° x 5.0')	" 135°-07'	"	2752 "

Tuesday 18th Nov '71 Day & night gangs - discharging coffee & cocoa — but dockers were hopelessly slow

Friday 19th Nov '71 Mobile shore crane (called a cherry-picker) used for a while, but it proved to be slow & awkward. Finally finished cargo @ 1535 hrs. Mor gear tested 1610 hrs. 1620 S.B.E. Singling up. 1631 Let go fwd 1636 ½ Leaves berth stemfirst. 1655 Pass Golden Gate Bridge. 1730 Bffr. Pilot ½. "GOLDEN GATE" (Black hull, white uppers, buff funnel). 1738 Pilot away. 1812 F.A.O.P. & Separation Zone Buoy to port 1.1'. 1920 Pt. Reyes 077° x 23'. Speed reduced @ 2112 hrs due to fog. DRAFT: SAILING (F) 16'-11" (A) 24'-01"

Saturday 20th Nov '71 0040 hrs. Pt. ARENA bng 051° (M) x 5.5' ½ on reduced speed until 0657 hrs due to fog. 0800 Blunts Reef "B" Buoy bng 047° x 5.2' (replaces the former "BLUNTS REEF LIGHTSHIP") NOON:- 41°-10'N 124°-36'W ST. 17.8 ms. DIST. 226' Av. Sp. 12.70 A.C. 13.0; D.O. 0.8; REVS. 73.7; DR E 214', Slip - 5.6%, Wind light variable; Slt/Fresh sea; Lon Swell. 1800 CAPE BLANCO bng 116½° x 3.6'.

Sunday 21st Nov '71 2300 hrs. Pt. GRENVILLE bng 064° x 22.8' NOON:- 47°-16'N 124°-47'W S.T. 24 hrs. Dist. 365 Av. Sp. 15.21 KTS. Revs 97.2, DR E. 386' Slip 3.95%, Wind N x W to W 3/5, Mod Sea & Heavy Swell; Mainly OVERCAST. Speed reduced & course altered in the afternoon to ease very heavy rolling. 1700 to 1703 C. VANCOUVER T.M.O. when rounding DUNCAN Rk buoy at entrance to Strait of Juan de Fuca 1745 TATOOSH I/S 165° x 3.5' 1808 hrs. TATOOSH'S bng 233° x 5.5 nms. ½ tended to set to the southward in the Strait. 2130 hrs E.C.T. Edz Hook bng 126½° x 5.1' 2147 HYAK PILOT BOAT abm. P.E. 2200 P.C.B. & SAILING. 2300 DUNGENESS Hook bng 130° (T) x 2 2400 Pt. WILSON 275° x 14 E.C.T. - S.T. 5:3 hrs. DIST 722'. TRS 44.6 KNOTS.

Monday 22nd Nov '71 FIRED TACOMA WASH 0210 hrs. Asarco MARCONSTONE Pt. 0252 Double Bluff 0305 Point no Point. 0330 Apple Cove. 0350 West Pt. Seattle. 0411 Robinson Pt. 0513 Tug "SHANNON ROSS" alongside 0518 Manoeuvring alongside. 0530 Lines ashore. 0545 All fast, F.W.E. ½ berthed fast side to at American Smelters Ore Dock @ Ruston, Commencement Bay. The pier is of wooden construction, very high, is fitted with two slang conveyors & two grab gantries; - railway lines also run onto the dock; tidal range 13 feet approx — peculiar tides, the range between two successive high and low waters differs by 5/7 feet; for instance, if the morning low water has a height of 6 feet the evening low water will have a height of 1 foot; or if the morning high water has a height of 13 feet the evening high water will be only 8/10 ft.

Commenced discharging at 0800 hrs – day & night gangs – bulldozers working in the holds. Draft. arr. (F) 16-07" (A) 23-10".

day 23rd Nov 71 Discharging continues – day & night gangs. Ship's derrick gear doubled to lift bulldozers in & out of holds, each bulldozer 5 tons. Heavy rain at times, but discharging continues.

uesday 24th Nov 71 Day & night gangs, discharging now very slow as cargo is removed from wings of hold & from between frame spaces etc., unable to discharge No 1 hold from 1645 to 1645 hrs due to vessel's height from the water & high tides (200 ford ballast in at this time) awaiting low water for grab to clear hold coaming. The outboard reach on the grab gantries is limited, difficulty was found when discharging the offside of No 4 hold due to the tunnel. vessel given a port list to facilitate discharge. Heavy rain at times. Cargo completed at 2105 hrs.

ursday 25th Nov 71 No shore labour on board today – National holiday, Thanksgiving Day. Every day (miserable day really) for ship's crew cleaning holds from 7 AM. till midnight, endless trouble with bilges, non-return ~~valves~~ valves broken by bulldozers & suction boat, a lot of ore in the bilges due to timber boards broken by bulldozers. Heavy rain at times, a cold wet lousy day.

iday 26th Nov 71 SHIFTING BERTH – Pilot J. V. SACHETT on board @ 0445 hrs. 0515 Singling up. 0545 Let go. 0545 Clear of berth, vessel proceeds to other berth. 0550 m/v "SHANNON FOSS" alongside. 0600 Proceed berth, it was a tight squeeze between two other ships, stern anchors used to keep a check of vessel's progress. 0625 Tugs ashore, making fast. 0639 F.A.E. ½ berthed port side to at PIER No 7 TACOMA. Taken on board @ 0800 (4 gangs), discharging coffee, loading wood pulp & loading lumber from barge "Foss 192" alongside, – lockers trouble-some, condemning perfectly good cargo runners.

aturday 27th Nov 71 4 Day gangs & one night gang – loading continuing in frequent rain showers, polyethelene covering laid to be put on any exposed cargo in square of hatches.

unday 28th Nov 71 Finished loading cargo at 1605 hrs. 1620 Nav. gear tested. 1640 Canadian Pilot "W. LEE" & American Pilot "V. SKRAYNE" on board S.B.E., tug "SHANNON FOSS" in attendance, singling up, 1652 Let go F & A.

1655 ½ Clear of berth. 1710 hrs Short engine breakdown. 2115 Ft. Vulcan
bug 180' x 2'. DRAFT SAILING TACOMA:- (F) 14'-09" (A) 16'-09"
Canadian pilot relieved American pilot at Line "Kiln".

Monday 29th Nov '71 HBR. POWELL RIVER B.C. 0656 Approaching berth.
0659 Let go starbd anchor. 0703 Tug "VANNETT" in attendance. 0713 Lines
ashore. 0723 in position & making fast. 0730 All fast, F.W.E. 0744 Starbd
anchor home in. 0800 Labour on board, & gangs. Loading newsprint
in N°s 2, 3 & 4 reefers & N°5 Lower Hold. Powell River has the largest
paper producing mill in the world. The river is dammed at its
mouth to provide power for the mill. A floating breakwater is
formed by ten old hulks which surround a log pond.
The logs are brought to the log pond by barge and dumped
by tilting the barge until the logs slide off. 1930 Completed
cargo, labour ashore. 2102 S.B.E., Swinging up F.R. 2110 Let go, vessel
moving off berth. 2112 ½ Clear of Berth. Dr. SAILING POWELL RIVER (F) 15'-00"
(A) 19'-00" 2400 MISSION PT. bug 044° x 7½'.

Tuesday 30th Nov '71 0156 TRACY PT. bug 225° (T) x 3·0'; 0300 ½ Rounding
East Point, very strong tide rips. 0345 ½ Rounding Iron Point.
Passed Star Sarah passenger liner "OCEAN NIAGARA" & new PACIFIC-AUSTRALIA
-DIRECT LINE container ship "DIMBOLA" on her maiden voyage.
0516 S.B.E. Approaching Victoria. 0524 Pilot Away 0536 F.A.E.P., Esquimalt
buoy bug. 025° (T), 1·0'. 0600 Race Rocks bug 000° x 2'. 0900 TATOOSH I/S 157° 5½
0900 ANATOLIA "N" bug 157° x 5'. Log - 47'-47½ 124'-52½ ST. 6th hrs Dist 101'
Av. Sp. 15·78 kts. Rev. 3845 Ave 105'. Slip 1·94% - Wind Wly 2/3, Slight Sea
& Low Swell. Partly cloudy, clear.

Wednesday 1st Dec '71 Speed reduced at 0120 hrs for arrival purposes - pilot
not boarding until daybreak. HBR. COOS BAY, OR. 0644 E.O.P.
Cape Arago bug 175° x 5'. ST. 18·8. Dist 263'. Av. Sp. 13·98. T.S.T. 25·2 hrs.
TOTAL DIST. 364'. 1ST AV. SPEED 14·44 knots. 0734 Pilot "W.E. Woods" on board.
0746 ½ in entrance channel. 0814 hrs. tug "COOS BAY" in attendance
& swinging in river. 0822 Lines ashore F & A. 0835 All fast; F.W.E.
berthed port side to at SITKA Dock, COOS BAY. This berth is used
as a lay-by berth, its a wooden pier that is so rotten that a
good sneeze would carry it away; it adjoins an old disused
pulp mill. The flood & ebb are very strong indeed. The berth is

in an eastward position & if it comes on to blow it may be necessary to have a tug stand by to keep the vessel alongside; due to strong flow of flood & ebb, it may require the engines to stem the tide.

Wednesday 2nd Dec '71. No cargo worked, vessel lying at Layby berth. Very heavy rain at times.

Thursday 3rd Dec '71. 0545 Han gear tested; 0550 P.O.B. Capt. N.E. Winter, tug "Cygnet" alongside. 0618 Singling up. 0625 Let go. 0617 ½ Clear of berth. 0626 ½ Swung & proceeding upriver. Strong SSW'ly wind & heavy rain. 0753 ½ Swinging off Coos Bay Docks, tugs "Coos Bay" & "Cygnet" in attendance. 0756 Let go starbd anchor — awaiting other vessel to clear berth. 0945 Commenced heaving anchor. 0920 ½ Alongside & making fast. 0930 All fast, F.W.E. ½ berthed port side to at Coos Bay Docks. Two gangs on board at 1000 hrs. — worked until 1745 hrs. No night gang — loading of lumber was carried out during the day in frequent rain showers.

Saturday 4th Dec '71. Very rainy day — 2 gangs loading lumber from 0800 to 1650 hrs. — no night gangs.

Sunday 5th Dec '71. More rain today — 2 gangs from 0800 to complete loading at 1610 hrs.

Monday 6th Dec '71. All mac. gear tested in preparation for sailing, awaiting pilot. Heavy seas running on the bar this morning. Pilot did not board until 1130 hrs. — conditions on bar reported improved. Pilot:- Capt. N.E. Winter. Tugs:- "Coos Bay" & "Cygnet". 1135 Singling up. 1143 Let go. 1145 Clear of berth. 1146 ½ Proceeds downriver. 1216 Pass Swing bridge. 1330 Crossing the bar. Sea room in manoeuvre at the sea buoy a bit tight due to large Japanese vessel, inbound awaiting pilot. Pilot unable to disembark to tug "Coos Bay" due to rough sea & heavy swell;- pilot carrying on to San Francisco. 1400 F.A.O.P. Cape Arago bng. 127' x 5'; ½ Proceeding on one boiler, E/R Requirements, Loading doors. 1715 Cape Blanco bng 099° T x 6.3'.

Tuesday 7th Dec '71. 0500 Blunts Reef bng 117 x 6.1', 1130 Pt. Arena bng 042° T x 5'. 1500 Pt. Reyes bng 111° (T) x 10.7'. ARR SAN FRANCISCO Pilot waived on V.H.F. Ch 10. Pilot boat "California" on station. 1648 E.O.P. "SF" Buoy bng 114° (T) x 3'. Total Dist. 365' T.S.T. 26.8 hrs. Total Av. Speed. 13.62 kts. 1705 Pilot:- M. Aitken on board. Draft:- Arr. 15-03" (F) 19'-10" (A)

25

1305 Golden Gate Bridge. 1850 Dock Pilot boarded. 1852 Sea & Coast Guy pilot away. 1902 Oakland Bridge. 1918 ½ proceeds Alameda channel. 1943 Tug "Kelly Murphy" fast. 1951 Affr. berth. 1953 Let go starbd anchor. 2000 Lines ashore. 2010 All fast, L.W.E. ½ berthed port side to Universal Dock, Alameda. Thursday 8th Dec '71. No gangs due to labour shortage. Bunkering from a barge 1720 to 2030 hrs. Oil spill in alleyways, washdeck fort & starboard. 2057 Bunkering barge away.

Friday 9th Dec '71 1513 One gang on board, floating crane "Smith Rice No 4" alongside - hoses and heavy lifts loaded ex deck. 1750 Floating crane away.

Saturday 10th Dec '71 No gangs today due to labour shortage.

Sunday 11th Dec '71 No gangs due labour shortage. Boat Drill in the morning starboard boat swung out.

Monday 12th Dec '71 3 gangs on board at 0800 hrs. - loading general cargo - 2 night gangs till 4 in the morning. Heavy rain at times during the day.

Tuesday 13th Dec '71 3 gangs at 0800 hrs. Shore carpenters on board during the day securing cargo. All completed and labour ashore at 1735 hrs. Sailing delayed 12 hrs due to E/R problems, condenser trouble - contaminated water.

Wednesday 14th Dec '71 SAIL SAN FRANCISCO DRAFT - (F) 15'-09" (A) 22'-05" 0645 Hand Gear Tested. 0645 Pilot - M. Bessingham on board; tug "Maria Lane Citizen" in attendance. 0710 Singling up. 0725 Let go. 0728 ½ Clear of berth. 0736 Tug away, ½ proceeds eastwards. 0845 Golden Gate Bridge. 0928 Hook Pilot Boat "California" 0944 Pilot away. 1000 F.A.C.P. "SF" Buoy tug (45 Tons) x 1-7' Visibility troubles from 1000 to 1500 - speed reduced. 1615 Cypress Pt. buoy 085° x 12-6'.

Wednesday 15th Dec '71 Considerable traffic encountered off Pt. Arguello & Pt. Conception. 0410 15th Bennet Pt Buoy tug 060°(T) x 6-7' 0743 We were "tagged this morning by U.S. Naval aircraft, SBE. 0749 Spot. The pilot of the plane was yelling at us through a loudhailer; he was difficult to understand. It was in Naval Air Missile Test Area. After we stopped the plane flew away & we carried on. Later communication from U.S. Coast Guard, Long Beach, told us to maintain course & speed so we would be out of the area before

the missiles started flying. Noon:- 32° 20'N 119° 10'W, Co. Vars., Dist 350, S.T. 24 hrs acc. Ar. Sp 14.58; Revs 91.4; H.C. 28.2; D.C. 0.7; DxE 357'; Slip 1.96%; Wind NW ⅘; Mod Sea & Swell; Partly cloudy; Clear; Air 10°(c); Sea 11°(c); Revs Down at Times - ⅙ Troubles. ½ Rolling & pitching easily. Clocks advanced 30 mins.

Tuesday 16th Dec 41 USN 7 to Benito Log 118° x 28.4' Noon:- 27° 29'N 116° 58'W Co. 114.3°(T) Dist 372'; S.T. 23½ Hrs. Ar. Sp. 15.83, Revs 99; H.C. 32.3; D.C. 1.1; DxE 379; Slip 1.85%; Wind NW - E x N ⅘; Mod Sea & Swell; Partly Cloudy; Clear, Air 15°(c) Sea. 15°(c). ½ Rolling & pitching easily. Some traffic met with during the day. Clocks ahead 30 mins.

Friday 17th Dec 41 0130 Cabo San Lazaro bg 037° x 15.8'. The light on Lazaro (range 21 M) was not sighted initially, nor was Cabo Tosco Lt. (Range 23 M) however, Pta Redonda Lt. (Range 6 M) was clearly seen at 15 miles distant. Visibility at the time was good - other ships lights were seen at 16 miles. Noon:- 22° 42'N 110° 22'W; Co Vars; Dist. 373; S.T. 23½ Hrs; Ar Sp 15.87, Rev 100½ H.C. 37.3; D.C 1.0, DxE 385'; Slip 3.12%; Wind NEly 3/4; Mod Sea & Low Swell; Air 19°(c) Sea. 28°(c) ½ Rolling & pitching easily.

Saturday 18th Dec 41 Noon:- 18° 21'N 105° 40'W Co 134½(T); Dist 372; S.T. 24 Hrs. Ar Sp 15½ Hrs. Revs. 101.7; H.C. 36; D.C 0.8; DxE 397'; Slip 6.54%; NEly 1/2; Slt Sea, Mod Low Swell; Partly cloudy; Clear. Air 25°(c) Sea 26°(c). ½ Rolling & pitching easily. Clocks adv. 30 Mins. Sprung a Fuel Drill @ 1615 hrs. No traffic.

Sunday 19th Dec 41 Noon:- 14° 42'N 101° 00W Co 133½; Dist 374'; S.T. 23½ hrs; Ar Sp. 15.91 knots. Revs. 101.3; H.C 35.0; D.C. 0.8; DxE 388'; Slip 3.61%; Wind Lt. Vars.; Slt Sea & Low Swell, Fine & Clear; 25°(c) Sun. 28°(c) Sea. ½ Rolling & pitching easily. Clocks GMT - 6½ Hrs. United ship met with @ 2330 hrs. (approx) from Panama to Yokohama, Japan & another ship passed on same route.

Monday 20th Dec 41 Noon:- 9° 30'N, 96° 47'W Co. 137½ Dist 369; S.T. 24 Hrs; Ar Sp 15.37 Kts. Revs 102.3; H.C. 36.0; D.C. 0.7; DxE 399'; Slip 7.51%; NEly ⅘; Slt Sea & Mod Swell; Fine & Clear. Air 25°(c) Sea 27°(c). ½ Rolling easily & pitching mostly. Clocks GMT - 6½ Hrs.; Adv. 30 mins. No traffic; chased after dark. Flying fish sighted in afternoon.

Tuesday 21st Dec 41 Overcast skies with rain in the morning - no sights. Noon:- D.R. 5° 13'N 92° 27'W Co. 135°; Dist 364'; S.T. 23.5 hrs.; Ar Sp. 15.50 kts. Revs. 102.7. H.C. 35 revs; D.C 1.2 revs; DxE 393'; Slip 7.37%; Wind NE to E 3/4; Slt Sea & Mod Swell; Partly Cloudy; Rain. Air 3°(c); Sea 27 °(c) ½ Rolling & pitching easily. Rain cleared in the afternoon. Star sights in the evening.

Wednesday 22nd Dec 41 Noon:- 0° 49'N 88° 03'W Co. 134° - 5'; Dist 374'; S.T. 24.0 hrs. Ar. Sp. 15.58, Revs 102.2, Fuel H.C. 33.0, D.C. 1.0. DxE 399, Slip 6.26% Wind SE'ly 3/4;

Slight sea & Low Swell, Mainly overcast & clear, showers. At 1000 hrs. this morning the emergency hand steering from the poop was tested & found satisfactory. Clocks advanced 30 mins.

Tuesday 23rd Dec '41 Noon:- 3°-23'S 85°-54'W Co. 135, Dist 355, S.T. 23.5 hrs. Av. Sp. 15.1 Kts. Revs 101, Fuel H.O. 31.5, D.O. 1.0, DKE 387, Slip 8.27%, Wind S'Ly 2-3. Slight sea & Low/mod. swell; Fine & Clear. Clocks advanced 30 mins.

Wednesday 24th Dec '41 Noon:- 7°-24'S, 80°-0'W, Co 135, 339 Miles, ST. 23.5 hrs Av. Sp. 14.4 Kts, Revs 100.9, Fuel H.O. 29.5, D.O. 1.0, DKE 386; Slip 12.2%, Wind SSE 2/3, Slight sea & Mod/low Swell; 0340 to 0830 Dense fog. Air 20° (C); Sea 20° (C).

EXHIBIT 67—Standing Order

CHAPTER V. DECK APPRENTICES.

PART 2 - PRACTICAL TRAINING PROGRAMME.

2. Emergency Duties. Duties of Officer of the Watch in event of location of fire, accidents, man overboard, etc. Turning circles, propeller action, Williamson turn. Arranging boat and fire stations.

3. Stability. Effect of slack tanks, stability/dead-weight calculations, deck cargoes. If possible, a vessel should be visited that is fitted with a stability and trim indicator (Ralston type).

4. Grain and Timber Cargo Rules. An understanding of the purpose of the Rules.

5. Chain Register. Annealing. Examinations.

6. Freeboard Survey.

7. L.S.A. Survey. Preparations and requirements.

8. Factory Acts. As applicable to ships.

9. Dry Docking. Should vessel dry dock during this period, every attempt should be made by Apprentice to learn the procedure, precautions before entering, dry dock reports, shell expansion plans, the examination of the underwater sections, and to witness any special operations. Use of shipyard terms.

10. Fire Fighting on ships. Types and use of equipment, location, type of fire, ventilation.

11. Company's routine paper work.

SECOND OFFICER.

1. Navigation. Times of sunset, sunrise, twilight, meridian passage. Meridian altitudes, ex-meridians, latitude by pole star, longitude by chronometer, Marco St. Hilaire. Horizontal and vertical sextant angles.

The Day's Work. The sailings. Average speed, distance made good, slip, use of tables and almanacs.

The use of tide tables, pilot books, lists of lights, Nemedri chart catalogue, notices to mariners, lists of radio aids, tide charts.

2. Care and Use of Instruments & Aids. Magnetic compasses, pelorus, chronometers, station pointer, gyro, radar and practice in radar plotting.

3. Chartwork. Course and distance between two points, courses with effect of current and leeway. Compass, Magnetic and True courses and bearings. Cross bearings, bearing and range, D/F bearings, four point bearing, doubling the angle on the bow, running fix, with current, distance off. Avoiding dangers, use of clearing marks, horizontal and vertical angles. Maximum distance of lights. Construction and use of line of soundings.

4. Meteorology. Elementary meteorology. Cloud forms, judging of wind force, wave heights and periods. Buy's Ballot Law. Read section on tropical revolving storms in pilot books. Weather charts, current charts. Making out weather reports.

CHAPTER V. DECK APPRENTICES.

PART 8. - PRACTICAL TRAINING PROGRAMME.

5. Read sections in pilot books on Navigation in ice, Oil on Water.

6. Chart Correcting.

THIRD OFFICER:

1. Life Saving Appliance Rules and Fire Fighting Rules. Supervision of maintenance of equipment.

2. Rule of Road. Articles one to thirty two. A thorough understanding of lights and steering and sailing rules. The standing Notices to Mariners.

3. Duties of a Junior Officer prior to proceeding to sea and entering port.

4. Launching of Lifeboats. Inflatable life-rafts. The use of sea anchors.

5. Signalling. Revision of previous work on the International Code, morse and semaphore procedure. Practice in morse signalling and semaphore (Six and eight words per minute respectively).

6. Routine Company's paper work.

7. Rockets and Line Throwing Apparatus. Rigging and Precautions. Regulations.

RADIO OFFICER.

1. Radio Direction Finder. Practice in use. Errors, limitations, corrections, gyro syncronization.

2. Consol Bearings.

3. Echo Sounder.

CARPENTER:

1. Bilge, ballast and scupper arrangements, ventilators or pipes and entrances. These should be located and identified and the methods and materials for securing the latter on each ship.

CHAPTER V. DECK APPRENTICES.

PART 2 - PRACTICAL TRAINING PROGRAMME.

THIRD OFFICER:

1. The International Code Book. The contents and use of different tables and appendices. The procedure for the use of the code and for Morse and Semaphore messages. Practice in coding and decoding. A knowledge of the abbreviations used in Morse procedure.

2. The Use of the Compass to ascertain risk of collision.

3. Articles 1 - 32.

4. The use of a hydrometer and precautions when taking a reading.

5. Derricks and spans. Stresses and strains. Parallelogram of forces.

6. Requirements for navigation lights and sound signals.

7. Life Saving Appliance Rules.

CHIEF ENGINEER:

1. A description of the general principles of different types of engine - reciprocating, turbine and diesel, and how the power is transmitted to the propeller.

2. A simple layout of bilge and ballast lines, valves and pumps.

RADIO OFFICER:

1. The checking, charging and maintenance of batteries.

2. The lifeboat radio transmitter. The rigging, use and general particulars.

Fourth Year.

MASTER:

1. The duties of a Junior Officer at sea, at anchor, in port and working cargo. The Company's interests and responsibility with regard to cargo. Log book entries.

2. Company's routine paper work.

CHIEF OFFICER:

1. Cargo. Duties of a Junior Officer whilst vessel is working cargo. General principles of stowage, distribution of weights (vertical and longitudional), safety, segregation, protection and securing. Prevention of long hatches, overstowing, overcarriage. Fire hazards and precautions. Dunnaging and ventilation. Importance of keeping accurate records of times, temperatures, ventilation measures, damaged cargo. Practice in making cargo plans, cargo calculations.

EXHIBIT D—East Coasts of Central America and Gulf of Mexico Pilot, First Edition, 1970 (British)

N.P. No. 69A

929a

East Coasts of Central America
and
Gulf of Mexico Pilot

EAST COASTS OF CENTRAL AMERICA FROM PUNTA TIRBI TO CABO CATOCHE--COASTS OF GULF OF MEXICO AND MISSISSIPPI DELTA TO CAPE SABLE AND FLORIDA BAY—ISLANDS IN THE WESTERN CARIBBEAN SEA NORTHWARD OF ALBUQUERQUE CAYS—MOSQUITO BANK

FIRST EDITION, 1970

PUBLISHED by THE HYDROGRAPHER OF THE NAVY

930ω

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Second Edition—West India Pilot, Volume I . .	1861
Third Edition— ,, ,, ,, ,, . .	1872
Fourth Edition— ,, ,, ,, ,, . .	1883
Fifth Edition— ,, ,, ,, ,, . .	1893
Sixth Edition— ,, ,, ,, ,, . .	1903
Seventh Edition—West Indies Pilot, Volume I . .	1912
Eighth Edition— ,, ,, ,, ,, . .	1923
Ninth Edition— ,, ,, ,, ,, . .	1929
Tenth Edition— ,, ,, ,, ,, . .	1941
Eleventh Edition ,, ,, ,, ,, . .	1956

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PREFACE

The First Edition of the East Coast of Central America and Gulf of Mexico Pilot (N.P. No. 69A) has been prepared by Captain G. A. French C.B.E., Royal Navy, and contains the latest information received in the Hydrographic Department up to the date given below.

It contains information which supersedes that at present published in West Indies Pilot, Volume I, Eleventh Edition, 1956, Chapters V to X, with Supplement No. 6 dated 19th March, 1968.

Current and ice information has been revised by the Meteorological Office, Bracknell.

Information on radar ranges has been supplied by the United Kingdom Chamber of Shipping, London.

The following sources of information other than Hydrographic Department Publications and Ministry of Defence papers have been consulted:

BRITISH.

Statesman's Yearbook	1969–70.
Whitaker's Almanack	1970.
Ports of the World	1970.
South American Handbook	1970.

MEXICO.

Derrotero de las Costas Atlanticas de Mexico, America Central y Colombia – Publication F.H. No. 101, Mex. D.F. 1962.

UNITED STATES OF AMERICA.

Sailing Directions for East Coast of Central America and Mexico. H.O. Publication No. 20, 1952, corrected to change No. 11 dated 8 March, 1969.

United States Coast Pilot, No. 5: Atlantic Coast, Gulf of Mexico, Puerto Rico and Virgin islands: Sixth Edition (1967), corrected by third supplement dated January 3rd, 1970.

U.S. Light List, Atlantic coast. H.O. 111A, 1967, corrected to change No. 22 dated 9th August, 1969.

U.S. Light List, Volume II: Atlantic and Gulf Coast – C.G. 160 dated 1970.

U.S.C. and G.S. Charts of the Gulf of Mexico up to and including those published in February 1970 have been consulted.

The diagrams showing currents have been taken from "Oceanographic Atlas of the North Atlantic Ocean" published by U.S. Navy Oceanographic Office.

G. S. RITCHIE,
Rear-Admiral,
Hydrographer of the Navy.

Hydrographic Department,
Ministry of Defence,
Taunton, Somerset, England.
7 August, 1970.

932a

Currents of the western part of the Caribbean sea.—Throughout the year the highly-constant Equatorial current sets west-north-westward over the greater part of this area. The mean rate is between ½ and 1 knot; a few currents have been observed in excess of 2 knots and the maximum rate reported is between 3 and 4 knots. As the current approaches Mosquito bank the greater part is deflected north-westward and flows over Rosalind bank at a mean rate of about 1½ knots. On rounding Mosquito bank the Equatorial current sets west to north-west across the Gulf of Honduras at a mean rate of ½ to 1 knot, passing to the northward of Islas de la Bahía, towards the off-lying cays of the Península de Yucatán. Here the current is deflected north-north-eastwards and increases in rate; in the rainy (summer) season it attains a rate of 1½ to 2 knots as it sets towards the Yucatan channel.

Mosquito bank and off-lying islands.—The main current sets through the off-lying islands southward of Rosalind bank in directions mostly between north-west and south-west at a mean rate of 1 knot and a maximum rate of 2 to 3 knots. The greater part then sets north to north-west to round Mosquito bank but, in the vicinity of Isla de Providencia, a part of the current is deflected south-westwards towards San Juan del Norte, where it turns south and later rounds Golfo de los Mosquitos, continuing eastwards as a countercurrent with a mean rate of 1 knot. Over Mosquito bank, inshore of these deflected streams, the currents are variable and to a large degree dependent on the wind which is prevailing, or has lately prevailed. In particular, a Norther may cause a current of ½ to 1 knot to set southwards close inshore along the whole bank southward of Cabo Gracias á Dios to join the countercurrent in the vicinity of San Juan del Norte.

Gulf of Honduras.—The Equatorial current, on rounding Mosquito bank, sets west to west-north-west across this gulf at a mean rate of ½ to 1 knot, passing northward of Islas de la Bahía and southward of Misteriosa bank. The greater part of this current is deflected north-north-eastwards as it reaches the banks and cays off the east coast of the Península de Yucatán and increases in strength; it attains a rate of 1½ to 2 knots off this coast in the rainy (summer) season. The rate increases further to 3 knots as it sets over Arrowsmith bank towards the Yucatan channel. A part of the main current is deflected southwards at about the latitude of Belize towards the head of the Gulf of Honduras, where it turns eastwards and sets inside the 100-fathom (182m9) line to Bahía Trujillo. From this latter area to Cabo Gracias á Dios the currents are more variable. Both the southerly set and the east-going countercurrent are stronger in the winter season, especially during and after Northers.

Currents in the Yucatan channel.—The greater part of the flow of water across the Caribbean sea is constrained to flow through the Yucatan channel towards the Gulf of Mexico. The western boundary of the current through this channel is Banco de Campeche, and the eastern boundary lies some 20 miles from Cabo San Antonio in western Cuba. The axis of the current is found at about 35 miles from the coast of Yucatan, 6 miles beyond the 100-fathom (182m9) line on Banco de Campeche, over depths of 200 to 400 fathoms (365m8 to 731m5). The mean rate along the axis is about 4 knots. At a distance of 20 to 35 miles from Cabo San Antonio the mean rate is 1 knot; at 50 miles, 2 knots; at 65 miles, 3 knots; at 78 miles, 4 knots; and at 90 miles, or about 25 miles from the coast of Yucatan, 1 knot. The direction of the current, throughout the breadth, is northerly. The rates quoted above are representative of the spring months April, May and June. In summer the rate increases and in winter it decreases a little. The boundaries of the current contract when the rate decreases and expand

Chart 1511.

A vessel approaching from eastward should steer with Lever hill bearing 276°, until North cliff bears 343°, whence she should proceed as directed above.

Facilities.—It was reported in 1966, that a wharf was under construction westward of Lawrance point.

An airport is situated on the island.

There is a hospital.

A patent slip is available for boats of less than 40 feet (12m2) in length.

A small naval base is located about half a mile northward of Sterthenberg point.

Western side of Isla San Andrés.—Anchorage.—Dangers.—The western side of Isla San Andrés presents no particular features, being composed chiefly of rocky cliffs: it is bold, with depths of from 30 feet to 12 fathoms (9m1 to 21m9), dark coral, from 1½ to 3 cables offshore.

Chart 1511, plan of South-west cove.

Evans point, 4 miles south-south-westward of Pull point (*12° 36′ N., 81° 43′ W.*) and 4 cables south-westward of Lever hill is the west extremity of the island, off which are several rocks awash.

There is good temporary anchorage in depths of 42 feet (12m8) clean sand, 3 cables south of Evans point and 2½ cables west of the entrance to South-west cove.

South-west cove, the only indentation of any importance in the western coast of Isla San Andrés, is entered at the head of this bight. Its entrance between the northern entrance point and Entrance island, a coral rock situated close northward of the southern entrance point, is about 40 yards (36m6) wide, but it opens into a basin about 2 cables in extent. Within this cove there are depths of from 12 to 24 feet (3m7 to 7m3) for a distance of about half a cable within its entrance. The cove is connected with the villages of Bowie and San Luis by road.

Chart 1218.

RONCADOR BANK.—Roncador cay (*13° 34′ N., 80° 04′ W.*) lies about half a mile within the north-western extremity of the bank; it is barren, and is composed of sand and blocks of coral about 13 feet (4m0) high. From Roncador cay a reef extends about 3 miles south-eastward to some above-water rocks, whence it curves gradually southward to the southern end of the bank, about 6 miles south-south-eastward of Roncador cay. About half a mile south-eastward of the cay and close within the edge of the reef is a small above-water sandbank, and about one mile farther south-eastward there is another; two more similar sandbanks lie, one about half a mile, and the other about three-quarters of a mile, within the southern end of the bank.

The north-eastern side of the reef is bordered by a bank about half a mile wide, with depths of from 30 feet to 20 fathoms (9m1 to 36m6), sand and dark coral over it; off the southern end of the reef this bank is about 4 cables wide. On the eastern side of Roncador bank depths of less than 60 feet (18m3) extend about 4 cables off the drying reef.

The western side of the bank is bordered by detached shoals extending as much as 2 miles off the western side of the reef, with general depths of from 30 to 60 feet (9m1 to 18m3) around them. The outermost dangers are two 24-foot (7m3) patches about 1½ and 3 miles southward of Roncador cay and a 21-foot (6m4) patch about 4¼ miles southward of the same cay.

Caution.—Most of this description is taken from a survey carried out in 1835.

Discoloured water.—A large area of discoloured water, having

Chart 1218.

every appearance of a shoal, was reported, in 1901, about 7 miles north-westward of Roncador cay.

Light.—A light is exhibited, at an elevation of 52 feet (15m8), from a red pyramidal framework tower on a tank, situated on the northern end of Roncador cay.

Anchorage.—During the usual trade winds there is good anchorage, in depths of from 30 to 42 feet (9m1 to 12m8), for vessels with local knowledge, on the western edge of Roncador bank, avoiding the coral patches which are easily seen.

Current.—There is usually a north-west-going current which may attain a considerable rate. The tidal streams are not perceptible.

Chart 1334.

ISLA DE PROVIDENCIA.—Isla de Providencia (Old Providence island), which belongs to the Republic of Colombia, lies with Jones point (*13° 23′ N., 81° 22′ W.*) its northern extremity, about 77 miles westward of Roncador cay; close westward of Jones point is Isla Santa Catalina. These islands are of volcanic formation, and the centre of Isla de Providencia is hilly, rising to three peaks of nearly equal altitude; High peak, the highest, situated about 2¼ miles southward of Jones point, is 1,190 feet (362m7) high. The hills are of rocky formation scantily covered with vegetation. From these heights large rugged irregular spurs branch off to almost all parts of the island, terminating at the coast in peaked hills from 300 to 700 feet (91m4 to 213m4) high. A spur extends from the centre of the island to Jones point; on this spur, about 8 cables from the point, Split hill rises to a height of 550 feet (176m6). When seen from north-westward or south-eastward, it presents a rocky chasm about 60 feet (18m3) wide and 80 feet (24m4) deep, which is very distinctive. *See* view B on chart 1334.

Isla de Providencia lies on a coral bank, which, with depths of less than 100 fathoms (182m9) over it, extends about 10½ miles northward, 3 miles southward, and from one to 2 miles eastward and westward from the island.

Airfield.—An airfield was under construction on the island in 1967.

Light.—A light is exhibited, at an elevation of 180 feet (54m9), near the southern extremity of Isla de Providencia.

Caution.—There are strong and irregular currents in the vicinity of Isla de Providencia. Several vessels have been wrecked on the reefs.

Eastern side of Isla de Providencia.—Dangers.—Anchorages.—Low cay is situated on the extremity of a reef about 8½ miles northward of Jones point; it is about 2 feet (0m6) high, and from it a coral ledge, which dries in places, extends about half a mile southward; there are depths of 42 feet (12m8) close to this ledge and of 100 fathoms (182m9) about 3 cables westward of it.

From Low cay a reef, on which lie many above-water rocks and on which the sea breaks, trends about 2½ miles east-south-eastward, thence 12 miles southward and thence 3¼ miles west-south-westward forming a barrier reef about one mile off the eastern and southern coasts of the island, and terminating about 1¼ miles south-south-westward of the light-structure.

Depths of less than 60 feet (18m3) extend about 9 cables northward from the northern side of this barrier reef, about 1½ miles off the north-eastern portion, up to 1¼ miles off the central portion and from three-quarters of a mile to half a mile off the remainder of the reef.

Between the barrier reef and the island there is a passage from one to

Chart 1334.

There is anchorage, in depths of about 36 feet (11m0), with Alligator point, the western extremity of Isla de Providencia, bearing 168°, and the northern extremity of Isla Santa Catalina bearing 072°; but as the bottom in this vicinity is very uneven, and shallower depths than those charted may exist, vessels should exercise care when approaching this anchorage. A 27-foot (8m2) patch is situated about 2 miles westward of Morgan head and half a mile west-south-westward of this anchorage.

Directions.—A vessel approaching from northward should make the extremity of the reef which may be seen from a considerable distance as the sea breaks heavily on it; should daylight fail it would be advisable to anchor under Low cay (*13° 31′ N., 81° 21′ W.*) for the night.

Chart 1334, plan of Catalina harbour.

Mariners without local knowledge should not attempt to enter the harbour unless the services of a pilot can be obtained.

To enter the harbour a vessel drawing 15 feet (4m6) should steer with Morgan head in line with Fairway hill, bearing 143°, *see* view A on chart 1334, which leads between the outer shoals in a least depth of 17 feet (5m2). When Palm cay bears 051°, and is just open south-eastward of Basalt cay, *see* view D on chart 1334, she should steer to pass midway between Cat rock and Lawrence reef, and when Split hill is seen over the summit of the southern extremity of Isla Santa Catalina, bearing 129°, *see* view B on chart 1334, she should steer south-eastward parallel with the coast to the anchorage, in depths of from 18 to 20 feet (5m5 to 6m1), sand and grass, about 2 cables offshore and about 2¾ cables southward of Morgan head.

Chart 1218.

SERRANA BANK.—Serrana bank (*14° 28′ N., 80° 17′ W.*) is on an extensive shoal area, 17 miles long and 6 miles wide, with many coral heads. It is steep-to on all sides, but the western side is not quite so dangerous as the first sounding will probably be from 60 feet to 15 fathoms (18m3 to 27m4). The eye is the best guide when navigating over this bank. The greatest depths are found over white sand; all discolouration should be avoided.

On all except the western and south-western sides a barrier reef, with only three breaks on it, lies on the edge of the bank. On the face of the eastern projection of this reef the sea breaks with such violence that breakers are sighted from a distance of 2 or 3 miles before the cays themselves. In 1929 a cay, visible from a distance of 8 miles, was reported to lie on this eastern projection; its southern end appeared higher than its northern end. On the western and south-western parts of the bank there are numerous heads of live coral, with depths of only a few feet over them. This part of the bank is unfit for navigation except by small craft with local knowledge.

The lagoon in the eastern part of the bank is encumbered with detached shoals, which are steep-to, having depths of from 30 to 60 feet (9m1 to 18m3) almost alongside them. They are easily seen and avoided.

During the turtle season from March to August the bank is visited by fishing craft, and their masts and temporary huts on the cays may sometimes be seen before the reefs. The anchorages in the lagoon are suitable only for small craft.

Caution.—Most of this description is taken from a survey carried out in 1833. Mariners should exercise extreme caution in the vicinity of Serrana bank because of the strong currents.

Islets and dangers.—North cay is about 1½ cables in extent; it is

Chart 1218.

composed of broken coral, sand and shells, from 3 to 4 feet (0m9 to 1m2) high, covered with dwarf bushes. In 1932, an object resembling a light-structure was reported to stand on, or near this cay and it should not be confused with the light-structure on South-west cay, *see* below. Small boats can approach the western side of North cay.

A depth of 60 feet (18m3) was reported, in 1968, about 10 miles westward of North cay.

There are depths of 12 fathoms (21m9) about 2 cables off the western side of the cay, but there is no safe anchorage on account of the heavy swell that rolls in. A reef, which is only visible during northerly winds or strong trade breezes, extends about 3 miles south-westward from North cay (*14° 28′ N., 80° 17′ W.*).

North-west rocks, about half a mile within the western edge of the bank, and nearly midway between North and South-west cays, are two patches of rocks and sand, three-quarters of a mile apart and about 2 feet (0m6) high, over which the sea breaks in stormy weather.

South-west cay is the largest, and is situated on the south-western extremity of this bank, about 13½ miles south-south-westward of North cay; it is about half a mile in extent and 32 feet (9m8) high. It is composed of sand, covered with grass and stunted brushwood. At its south-western end masses of broken coral have been thrown up on the beach to a height of 3 or 4 feet (0m9 or 1m2). This cay is entirely surrounded by broken water; in rough weather the only landing is on the northern side through a channel near the eastern end.

Eclipse rock, about 4 cables west-south-westward of South-west cay, is an isolated coral patch with a least depth of 15 feet (4m6) over it, and depths of from 42 to 54 feet (12m8 to 16m5) around. The rock is dark green in colour, and is not visible until close to.

A coral ledge extends a short distance from the western end of South-west cay, and from the eastern end of the cay a barrier reef, which dries in places, extends about 9 miles north-eastward. This reef is steep-to and, being somewhat protected by the reefs to windward, is not always visible. On the edge of the reef, about 6 miles north-eastward of South-west cay, there is a ledge of rocks about 2 feet (0m6) high and nearly half a mile long; and about 1½ miles farther in the same direction is an above-water sandbank.

Light.—A light is exhibited, at an elevation of 72 feet (21m9), from a red pyramidal framework tower on a tank situated on South-west cay (*14° 16′ N., 80° 24′ W.*).

Channels.—Dangers.—South Cay (South) channel, about midway along the southern side of Serrana bank, is an opening in the reef, about 3 cables wide, marked by three small cays. Narrow cay, a narrow strip of broken coral about 3 cables in extent, lies on the western side of the entrance; South cay, composed of sand covered with grass, is on the eastern side of the entrance about half a mile east-south-eastward of Narrow cay; and Little cay, composed of sand, covered with grass, lies facing the entrance to the channel about 7 cables north-north-eastward of Narrow cay. All these cays are low.

This channel passes close to Narrow cay and has depths of from 30 to 42 feet (9m1 to 12m8) in it. A spit, with depths of less than 30 feet (9m1) over it, extends nearly 3½ cables westward from South cay. Depths of from 24 to 42 feet (7m3 to 12m8) may be carried eastward inside the reef by avoiding the dark shallow coral patches. Three 12-foot (3m7) patches lie between 4 and 6 cables northward of South cay. In the channel north-westward between Narrow cay and Little cay, there are depths of from

Chart 1218

15 to 18 feet (4m6 to 5m5), but there is a 6-foot (1m8) patch in the middle.

From South cay a reef extends about 3 miles eastward where it is broken and forms, with the south-western end of the eastern reef, East Cay (East) channel. East cay, situated on the western side of this channel is composed of coral blocks and sand about 3 feet (0m9) high. About half a mile north-north-eastward of East cay is a group of above-water rocks lying on the extremity of the drying reef extending from that cay, and about 8 cables farther northward is an above-water sandbank rising from a large detached drying reef.

East Cay channel is about half a mile wide at the entrance and has depths of from 42 to 60 feet (12m8 to 18m3) in it; but within the entrance are dark shallow coral heads which are steep-to and must be avoided. North (North-east) channel, about 3¾ miles north-north-eastward of East cay, is about half a cable wide; it has depths of 42 feet (12m8) and is straight.

Tidal streams.—Over the western part of the bank there are no perceptible tidal streams, but through the channels in the reefs the in-going and out-going streams attain rates of from 1½ to 2 knots.

Anchorages.—Temporary anchorage may be found, in depths of from 42 to 54 feet (12m8 to 16m5), white sand, half a mile north-north-westward of South-west cay (*14° 16′ N., 80° 23′ W.*).

The best anchorage in South Cay channel is, in depths of about 27 feet (8m2), with Little cay bearing about 280° and South cay bearing 195°. A vessel may, however, anchor, in depths of 42 feet (12m8), just within the entrance in a central position between the three cays.

Small vessels may anchor close within the entrance to East Cay channel, in depths of from 42 to 54 feet (12m8 to 16m5), about 6 cables east-north-eastward of East cay.

For all these anchorages local knowledge is necessary.

QUITA SUEÑO BANK.—Caution.—Most of this description is taken from a survey carried out in 1833.

Quita Sueño bank is situated with the northern extremity of the reef on it about 45 miles west-north-westward of South-west cay on Serrana bank; it is dangerously steep-to especially on its eastern side. About one mile within its eastern edge a coral reef, which is above water in places, extends about 23 miles southward from its northern end. Depths of 60 feet to 20 fathoms (18m3 to 36m6), coral sand, extend about 6 miles northward from the northern end of the reef, and depths of from 60 feet to 55 fathoms (18m3 to 100m6), coral sand, extend about 2 miles southward and 10 miles west-south-westward from the southern end of the reef. The only break in the reef lies near the middle, through which a boat, with local knowledge, might pass. Westward of the reef depths of less than 20 fathoms (36m6) extend about 8 miles off the northern portion and about 12 miles off the southern portion.

The area for about 2½ miles westward of the reef is encumbered with dangerous rocky patches, and abreast the middle part a spit of shallow rocky ground extends nearly 6 miles westward. This foul ground is not safe even for boats, as the heavy surf so disturbs the sand on the bottom that the shoals are not easily distinguished.

According to a report received in 1926 the only objects visible above water on this bank were the light-tower near its northern end, and a small sharp-pointed rock about 8 miles southward of the light-tower. Depths of from 42 feet to 15 fathoms (12m8 to 27m4) were found from

Chart 1218

4 to 7 miles eastward of the charted position of the eastern edge of the bank.

The stranded wreck of *Kai Kata Maru*, which is radar conspicuous, lies 9 miles southward of Quita Sueño light-tower. Dangerous sunken wrecks lie 12, 15½ and 21½ miles southward of the same light.

The following dangers, their positions given from the light-tower, were reported in 1967: a 42-foot (12m8) shoal, 8 miles south-eastward; a 65-fathom (118m9) bank, 5¾ miles eastward; a 60-foot (18m3) shoal, 13½ miles northward and a 14-fathom (25m6) bank, 15 miles north-north-westward.

In 1906, the s.s. *Aureola* took the ground on a shoal, over which depths of from 17 to 22 feet (5m2 to 6m7) were obtained, situated about 14 miles west-south-westward of the light-tower.

In 1910 the s.s. *Rose Lea* took the ground on a coral head, with a depth of 16 feet (4m9) over it, about 12 miles south-westward of the light-tower.

In 1964, a depth of 60 feet (18m3) was reported about 38 miles west-north-westward, and a depth of 11 fathoms (20m1) about 36 miles north-westward, respectively, of Quita Sueño light-tower. Reported shoal depths which lie about 55 miles north-north-westward of the light-tower are referred to on page 88.

Light.—A light (*14° 29′ N., 81° 08′ W.*) is exhibited, at an elevation of 45 feet (13m7), from a white tower with black lantern and a black and white diamond daymark on a tank, situated close to the northern extremity of the drying reef on Quita Sueño bank.

Anchorage.—The bank westward of the foul rocky ground has depths of from 60 feet to 15 fathoms (18m3 to 27m4), coral sand, over it, and affords good anchorage; the sea being broken by the reef.

Current.—Caution.—Caution should be exercised when passing eastward of Quita Sueño bank as the current here sets strongly to the westward and on the the bank.

Chart 486.

NEW BANK.—Caution.—Most of the description of this bank is taken from a survey carried out in 1835.

New bank or Bajo Nuevo, extends about 15 miles east-north-eastward from a position about 130 miles north-eastward of South-west cay on Serrana bank. It is the easternmost of the outlying banks, and on it lie East and West reefs. The south-western end of the bank has not been surveyed, and its extension south-westward remains to be determined. Depths of 12 feet (3m7) are reported to extend up to 10 miles 2 westward of New bank.

East reef, which lies at the north-eastern end of the bank, is semi-circular in shape and steep-to on its northern and eastern sides, but depths of less than 20 fathoms (36m6) extend about one mile north-eastward from it. A dry sand bore or cay, from which rocky heads extend about 2 miles north-westward, is situated at its south-western end. The north-western extremity of the drying reef lies about 2½ miles northward of the sand bore and the eastern extremity of the reef is about the same distance north-eastward. The area within this reef is full of rocky heads.

A stranded wreck lies on the northern end of East reef.

West reef extends about 6½ miles along the south-eastern side of the bank, south-westward of East reef, from which it is separated by an opening about one mile wide. There are charted depths of from 54 feet to

EXHIBIT E—Admiralty List of Radio Signals

Volume 2, 1971 (British)

939a

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FOR IDENTIFICATION
EXAM OF
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ADMIRALTY LIST OF

RADIO SIGNALS

VOLUME 2 1971

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940a

DIRECTIONS FOR CORRECTING THIS VOLUME

This edition contains all information received up to 14th August 1971. Subsequent corrections will be included in Section VI of the Weekly Edition of Admiralty Notices to Mariners. The number of each Weekly Edition should be recorded in the table below. New, or completely amended stations will bear the weekly number, but for all manuscript corrections the number should be inserted in the margin.

The appropriate indices and diagrams should also be amended as necessary.

NOTATION OF AMENDMENTS

Section VI Weekly Edition of Notice to Mariners No	Date Corrected	Section VI Weekly Edition of Notice to Mariners No	Date Corrected	Section VI Weekly Edition of Notice to Mariners No	Date Corrected

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PREFACE

This edition of the Admiralty List of Radio Signals, Volume 2, contains information received up to 14th August 1971, and supersedes the 1969 edition of Volume 2. All subsequent corrections to this list will be included in Section VI of the Weekly Edition of Admiralty Notices to Mariners, copies of which can be obtained gratis from the Agents for the sale of Admiralty Charts.

Changes have been made in the detailed presentation of the information in this Volume, as compared with previous editions. Apart from the change to an International Standard paper size, the station details have been simplified and reduced to essential information required by the user. This has permitted a generally columnar layout, giving, it is hoped, improved readability.

The principal changes are:

(1) CHARACTERISTIC. Full details are no longer given.

(2) MORSE EQUIVALENT SYMBOLS are no longer shown, unless not self-evident.

(3) All RADIOBEACONS, including AERO RADIOBEACONS, are listed in geographical sequence; all appear in the Alphabetical List of Identification Signals and all are numbered.

(4) The NUMBERING SYSTEM has been completely changed, the station numbers are no longer related to those in other Volumes of the List.

(5) The RADIOBEACON DIAGRAMS have been re-designed and simplified; they now show only the name and number of the station, different colours being used to differentiate between Marine Radiobeacons and Aero Radiobeacons. Diagrams are no longer bound in the book, but are available as a separate publication (N.P. 272(2a)).

(6) The number of AERO RADIOBEACONS has been considerably reduced in areas where marine radiobeacons are plentiful.

(7) RADIO D/F STATIONS no longer form a separate section of the Volume but are included in a combined list of Radiobeacons and other Radio Aids to Navigation.

(8) The sections—"International Allocation of Call Signs" and "Alphabetical List of Call Signs" have been omitted.

Mariners and others are invited in the interests of navigation to forward to the Hydrographer of the Navy any information that may come to their notice, which would be useful for the correction of Charts and other Hydrographic Publications; early advice as to newly discovered dangers, and of the establishment of, or changes in, any aids to navigation, is specially requested. A copy of form H.102, on which to render information, is bound in the Weekly Editions of Notices to Mariners; these forms can be obtained gratis from the Hydrographer of the Navy, or from any of the Agents in Great Britain and abroad, a list of whom will be found in Admiralty Notice to Mariners No. 2.

Hydrographer of the Navy

Taunton,
Somerset.
14th August 1971.

943ω

ABBREVIATIONS

The following list explains the meanings of certain abbreviations used in this volume.

ALRS	Admiralty List of Radio Signals
AO	Continuous waves, unmodulated.
A1	Continuous waves, unmodulated, with on-off keying.
A2	Continuous waves, amplitude modulated at audible frequency with keyed signals.
A3	Continuous waves, amplitude modulated R/T.
A3A	Single sideband, reduced carrier.
A3H	Single sideband, full carrier.
Calib	Calibration.
Cont	Continuous.
D/F	Direction Finder or Direction Finding.
GMT	Greenwich Mean Time.
H+ . . .	Commencing at . . . min past the hour.
Ident	Identification Signal.
inop	Inoperative (out of service).
ITU	International Telecommunication Union.
kHz	Kilohertz.
kW	Kilowatts.
Lt	Light.
Lt V	Light-vessel.
m	Metres.
min	Minutes.
MHz	Megahertz.
Occas	Occasional.
OWS	Ocean Weather Ship.
PA	Position Approximate.
P/L	Plain language.
PPI	Plan Position Indicator (radar screen).
PV	Pilot Vessel.
QTG	Coast Radio Stn providing a Radiobeacon service on request.
RD	Directional Radiobeacon.
Repd	Reported
RG	Radio Direction Finding Station.
R/T	Radio Telephone or Radio Telephony.
RW	Rotating Pattern Radiobeacon.
Rx	Receiver.
sec	Seconds.
Seq	Sequence.
Sig	Signal.
Stn	Station.
Tel	Telephone.
Tx	Transmitter.
Ufn	Until further notice.
W/T	Wireless Telegraphy.

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RADIOBEACONS AND RADIO DIRECTION FINDING STATIONS

DEFINITIONS AND GENERAL INFORMATION

Definitions and explanations of the following terms used in this volume, together with relevant general information, will be found on the pages indicated.

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AEROMARINE RADIOBEACON

A radiobeacon established for both marine and air navigation. Shown as Aeromarine in column 2 of station details. The information regarding such stations may be received from aviation, rather than marine, authorities.

AERO RADIOBEACON (AERO RC)

A radiobeacon established for the use of aircraft. Shown as Aero RC in column 2 of station details and on charts. Only selected Aero Radiobeacons likely to be of particular use for marine navigation are listed and charted. A directional Aero Radiobeacon is known as a Radio Range.

Caution:
It is very important to bear in mind the following facts when using Aero Radiobeacons:

1. The inclusion of an Aero Radiobeacon in this volume does NOT imply that it has been found reliable for marine use.

2. It is not possible to predict the extent to which land effect may render bearings unreliable.

3. Although every effort is made to publish changes as they occur, information concerning alteration, shifting or withdrawal of Aero Radiobeacons may fail to reach the Hydrographic Department in time for a notice to be promulgated before the event.

4. A number of Aero Radiobeacons considered to be particularly unsuitable for marine use have been omitted from this edition. Associated chart action will be effected as opportunity occurs. Meanwhile, mariners are warned that the charted position of an Aero Radiobeacon not listed in this volume may be in error.

CALIBRATION OF SHIPS' D/F—CALIBRATION STATION (CALIB STN)

Owing to the differing requirements of navigation and calibration, it is customary to provide separate Txs, or at least separate transmissions, for the two purposes. A Tx which is intended solely for the calibration of ships' D/F is classified as a Calibration Station. This term is also used to indicate a distinct and separate service provided at a radiobeacon station. Calibration stations are not charted.

Arrangements for Calibration in Certain Countries

Details of the organization of special transmissions for Calibration purposes in certain countries are given below: the countries are mentioned in alphabetical order. The information applies to all calibration transmissions given by stations in the countries concerned, unless otherwise stated in the list, which gives necessary particulars in respect of stations in countries which are *not* mentioned below.

Calibration transmissions given by a radiobeacon Tx consist of the normal radiobeacon characteristic unless otherwise stated in the list.

Australia

Calibration transmissions are available, on request, from one hour after sunrise to one hour before sunset, at radiobeacon stations at which beacon service is not continuous. Prior notice should be given, stating, as nearly as possible, the anticipated time. For procedure see paragraphs 2(c) to 2(j) under Great Britain and Ireland (below). A charge will be made at the rate of A$1 for each half hour or part thereof.

Canada

A request for transmissions from a Calibration Station should be addressed to the nearest Coast Radio Station, giving 6 hours' notice and stating the time at which calibration is to commence. Calibration transmissions will continue for 6 hours from the stated time. No charge is made.

Denmark

Danish radiobeacons other than those which give a continuous beacon service will transmit continuously for calibration purposes in clear weather on request. The request should be made either to the Lighthouse Authority in København, between 0830 and 1600 (Local time), or to the particular radiobeacon station concerned, giving the name of the Shipping Company to which the account should be forwarded. A charge will be made at the rate of 12 Kroner for each half hour or part thereof.

Germany

Calibration transmissions are available, on request, from special calibration Txs at certain radiobeacon stations and at certain calibration stations on shore.

A request for calibration transmissions should be made, if possible to the station itself. Failing direct contact, the request may be sent via the Call Station specified. The request should state the time at which calibration is required to commence and the frequency and duration of transmissions required. The duration of transmissions given will be as requested, but with a short pause after 110 minutes. If a ship wishes the station to cut short the transmissions or to prolong them beyond the duration originally requested, she should make contact as for the original request.

In the case of calibration services provided by light-vessels, the ship which has requested the transmissions should, on arrival off the light-vessel, hoist Flag OQ and the International Code Geographical Signal of the light-vessel; the latter will hoist the Answering Pendant, which will be lowered at the conclusion of transmissions. It should be noted that calibration transmissions may not be available when a reserve light-vessel is on station.

Charge will be made at the rate of 6 DM for each half hour or part thereof.

Great Britain and Ireland

The following calibration services have been made available by the Corporation of Trinity House, the Northern Lighthouse Board and the Commissioners of Irish Lights. In addition, similar services are available at certain stations operated by local authorities, whose addresses are given in the list of service details.

1. Routine Service:

Either continuous from 1 hour after sunrise to 1 hour before sunset daily or for 1 hour during the morning and the afternoon in clear weather only. Times given in the list of service details are clock times, i.e. GMT or BST, whichever is in force at the time.

POWER

Where the controlling authorities do not state the range of a beacon, the output power, in kilowatts, is given. The following table gives a tentative guide to the range, in nautical miles at which an average beacon of given power may be expected to be usable for D/F purposes under good conditions.

Output Power	Range	Output power	Range
0.025	45	1.0	240
0.05	80	1.5	280
0.1	100	2.0	300
0.2	130	3.0	330
0.3	155	5.0	400
0.4	170	10.0	500
0.5	180		

"QTG" SERVICE

Coast Radio Stations which transmit signals on request for use with ships' D/F apparatus are listed under this heading, in alphabetical order, after the radiobeacons in each geographical section.

The procedure laid down for requesting this service is as follows:

Ship makes contact with the coast station, identifies herself, and sends "QTG ..... (times) ..... (kHz)", meaning "will you send two dashes of ten seconds each, followed by your call sign, repeated ..... times, on ..... kHz".

Coast Station replies "QTG ..... (times) ..... (kHz)", followed by the signals requested.

Details of hours of service calling and working frequencies, and transmitter power, will be found in ALRS, Volume 1. The details given in Volume 2 are limited to the name, call sign, station number and position. The frequency employed for transmission in response to a "QTG" request may be a special frequency reserved for this purpose, or any of the station's working frequencies. A request should normally specify 410 kHz (if listed in Volume 1), or alternatively that working frequency nearest to the frequency on which the ship's D/F is calibrated.

Coast Radio Stations providing "QTG" Service are indicated on Admiralty charts by the abbreviation R (or the obsolescent R°) placed against a small circle indicating the position of the Tx. Other coast radio stations are not shown on Admiralty charts at the present time. Their positions as listed in Volume 1 must be regarded as approximate.

RADIOBEACON (RC)

Radiobeacon is used in this volume to describe a non-directional beacon shown on charts as RC or the obsolescent Ro Bn.

RADIO BEARINGS: PLOTTING

The track of a radio wave, being a great circle, is represented on a chart on Mercator's projection by a curved line, except when exactly N–S, when it becomes a straight line coincident with the meridian. The true bearing of a ship from a radio station or vice versa is the angle contained between the great circle passing through either position and the corresponding meridian.

Meridians converge towards the poles and the difference in the angles formed by the intersection of a great circle with two meridians is known as the convergency; it depends on the differences of latitude and longitude between the points of intersection and can be approximately calculated from the formula:

Convergency in minutes = diff long in mins x sin mid lat

Convergency may be readily found from the convergency scale below, or by traverse table, entering the diff long as distance and mid lat as course, the resultant departure being the convergency in minutes. Alternatively the Half Convergency Diagrams published separately with the Radiobeacon Diagrams can be used.

Meridians on a chart on Mercator's projection being represented by parallel straight lines, true bearings have to be converted into mercatorial bearings by applying ± ½ the convergency before laying off the bearing from the station's position on the chart.

948a

ALPHABETICAL LIST OF MORSE IDENTIFICATION SIGNALS OF RADIOBEACONS AND "QTG" STATIONS

Signal	Name	Type	No
A3	Portland Head Lt	Calib Stn	5873
A	Amphitrite Pt Lt	RC	4595
A	Cape Bonavista Lt	RC	6199
A	Coats Island	RC	6305
A	Richibucto Head Lt	RC	6097
AA	Accra	Aero RC	1709
AA	Tampico	RC	5513
AAAA	Kao-hsiung	RC	3291
AAS	Aase	Aero RC	0797
AB	Abidjan	RC	1695
AB	Akraberg (Sumbo) Lt, Sydero	RC	0297
AB	Alexander Bay	Aero RC	1817
AB	Mys Abramovskiy	RC	3759
AB	PB Lt V	RC	0279
ABN	Albenga	Aero RC	1109
ACA	Acapulco	Aero RC	4765
AD	Abu Zabi	Aero RC	2099
AD	Adelaide	Aero RC	4115
AD	Ameland Lt	RC	0247
AD	Ostrov Askol'd	RC	3551
ADL	Adele Island Lt	RC	4071
AF	Mys Afrika Lt	RC	3661
AG	Cap de l'Aiguille Lt	RC	1509
AH	Akhtarskiy Lt	RC	1325
AH	Antalaha South	Aero RC	1907
AI	Auki	Aero RC	4045
AI	Aveiro	Aero RC	0953
AI	El Aaiun	Aero RC	1557
AIN	Wainwright	Aero RC	4485
AJ	Ajaccio/Campo Dell'Oro	Aero RC	1079
AJ	Ajos	RC	0553
AJ	Anjouan	Aero RC	1892
AK	Akrotiri	Aero RC	1381
AK	Anholt North Lt V	RC	0345
AK	Oukacha Lt	RC	1539
AK	Seria	Aero RC	3873
AKB	Akyab	Aero RC	3151
AKE	Asnkeion	Aero RC	1415
AKW	Amchitka Island	Aero RC	4514
AL	Alabat	Aero RC	3821
AL	Albany	Aero RC	4099
AL	Alert Bay	RC	4585
AL	Alevina	RC	3629
AL	Algiers	RC	1501
AL	Almagrundet Lt	RC	0609
AL	Amami O Shima	Aero RC	3381
AL	Pointe D'Ailly Lt	RC	0837
ALA	Mala	Aero RC	4879
ALB	Alboran Lt	RC	1006
ALD	Alderney	Aero RC	0161
ALN	Alno/Sundsvall	Aero RC	0589
ALT	Alicante	Aero RC	1011
ALU	Alhoceima	Aero RC	1525
ALX	Alexandroupolis	Aero RC	1267
AM	Amapa	Aero RC	5129
AM	Ambriz	Aero RC	1783
AM	Esan Misaki Lt	RC	3459
AME	Amendola	Aero RC	1171
AML	Andravida	Aero RC	1241
AMR	Almeria	Aero RC	1007
AN	Akhilleonskiy Lt	RC	1327
AN	Kuching	Aero RC	3883
AND	Andenes, Andoy	Aero RC	0795
ANT	Anholt	Aero RC	0347
AO	Aonai Misaki	RW	3493
AO	Arorae	Aero RC	4387
AO	Caio Lt	RC	1647
AOG	Rota	Aero RC	1001
AP	Active Pass	RC	4606
AP	Anapa Lt	RC	1330
AP	Gal Oya	Aero RC	3121
AR	Akureyri	Aero RC	6607
AR	Aracaju	Aero RC	5095
AR	Arendal, Hisoy	RC	0711
AR	Ashizuri Saki Lt	RW	3397
AR	Tubee Lt	RC	5639
ARI	Arica	Aero RC	4897
ARS	Ardrossan	Aero RC	4113
AS	Aarhuz Front Lt	RC	0353
AS	Abaridiri	RW	3477
AS	Angissoq	RC	6443
AS	Ashburton	Aero RC	4245
AS	Poronaysk Lt	RC	3615
ASN	Ascension Island	Aero RC	1775
AST	Trubadren Lt	RC	0669
AT	Augusta-Dromo Giggia Lt	RC	1149
AT	Mys Aytodor Lt	RC	1309
AT	Pontianak	Aero RC	3893
AV	Abrolhos Lt	RC	5083
AV	Aveiro Lt	RC	0955
AVS	Asturias	Aero RC	0923
AW	Mys Aniva Lt	RC	3569
AWAE	Axios	RD	1261
AWK	Wake Island	Aero RC	4427
AXA	Troughton Islet Lt	RC	4067
AXB	Cape Leeuwin Lt	RC	4097
AXC	Cape Borda	RC	4117
AXD	Alexandria	Aero RC	1431
AY	Abertay Lt V	RC	0099
AYT	Antalya	Aero RC	1365
AYV	Amucuro	Aero RC	5385
AZ	Oma Saki Lt	RC	3455
B	Almirante	RC	5453
B	Beaver Island, Nova Scotia	RC	6051
B	Cape Bauld	RC	6181
B	Cape Mendocino Lt	RC	4672
B	Cape Wickham Lt	RC	4131
B	Fowey Rocks Lt	RC	5617
B	Goodwin Island	RC	6265
B	Kains Island Lt	RC	4589
B	Mount Desert Rock Lt	RC	5893
B	Red Islet Lt	RC	6115
BA	Bakki	Aero RC	6557
BA	Ile de Batz Lt	RC	0855
BAK	Barseback	Aero RC	0653
BAQ	Barranquilla	Aero RC	5431
BB	Auckland	Aero RC	4215

Signal	Name	Type	No
RR	Round I Lt, is of Scilly	RC	0017
RS	Ristna Lt	RC	0487
RS	Rosario	Aero RC	3839
RSD	Elefthera	Aero RC	5327
RSD	Ras el-Sudr	Aero RC	2043
RSH	Dublin/Rush	Aero RC	0187
RSRN	Selvikurnef Lt	RD	6603
RSY	Rannesoy	Aero RC	0735
RT	Eastern Point Lt	RC	5865
RT	Fire Island	RC	5771
RT	Mersrags Lt	RC	0477
RT	Point au Fer Reef Lt	RC	5549
RT	Rankin Inlet	RC	6337
RT	Ras Tannurah	Aero RC	3013
RTI	Rottnest Island	Aero RC	4093
RTV	Rotvaer	Aero RC	0793
RU	Uturoa	[illegible]	4325
RV	Pointe Revellata Lt	[illegible]	1081
RW	Mys Numeroniemi	[illegible]	3801
RW	Scarweather Lt V	[illegible]	0025
RY	Bedford	[illegible]	6093
RY	Royal Sovereign Lt	RC	0149
RZ	Ramas Islands Lt	RC	6227
SA	Posyeta	Consol	3543
SA	Sable Island West End Lt	RC	6063
SA	Salale	Aero RC	2085
SA	Sambava South	Aero RC	1905
SA	Satto, Flakfort	Aero RC	0371
SA	Senigallia Lt	RC	1179
SA	Skagi	Aero RC	6559
SA	Stavernsodden Lt	RC	0705
SAD	Sidon	RC	1403
SAL	Sal	Aero RC	1615
SAL	Sali	Aero RC	1207
SB	Assab	Aero RC	2021
SB	Saint Brieuc	Aero RC	0851
SB	Segunda Barranca Lt	RC	5011
SB	South Bishop Lt	RC	0029
SB	Surabaja	Aero RC	3945
SBT	San Sebastian	Aero RC	0909
SC	Samch'ok	Aero RC	3357
SC	Sosnovetskiy Lt	RC	3777
SCO	Pisco	Aero RC	4881
SD	Sandettie Lt V	RC	0821
SDN	Gotska Sandon N.W. Lt	RC	0619
SE	Pointe Senetose Lt	RC	1077
SE	Sete-Mont Saint Clair Lt	RC	1045
SE	Skagsudde Lt	RC	0585
SEW	Lynnfield	Aero RC	5861
SEY	Mahe Island	Aero RC	1954
SF	Da Nang	Aero RC	3243
SF	Ostrov Sparfar'yeva Main Lt	RC	3625
SF	Skardhsfjara Lt	RC	6539
SF	Stora Fjaderagg Lt	RC	0577
SFI	Safi	Aero RC	1543
SFI	San Francisco	Consol	4677
SG	Kattegat South West Lt V	RC	0361
SG	Sfantul Gheorghe	RC	1291
SH	Skagen Havn; Outer N E Mole Lt	RC	0329
SI	Sagar Island Lt	RC	3091
SI	Simiutaq	Aero RC	6439
SIT	Biorka Island	Aero RC	4531
SJ	Sharjah	Aero RC	2097
SJ	Sinjon	Aero RC	3187
SJN	San Juan	Aero RC	4883
SK	Avachinskiy	RC	3653
SK	Sao Tome Lt	RC	5075
SK	Skallen	RD	0575
SK	Skomvaer Lt, Rost	RC	0787
SK	Smiths Knoll Lt V	RC	0131
SK	Songkhla	Aero RC	3217
SK	Vopnafjordhur	RC	6523
SKD	Skikda	Aero RC	1489
SKL	Skopelos	Aero RC	1259
SKP	Skipness	Aero RC	0065
SL	Sao Luis	Aero RC	5119
SL	Slattoroy Lt, Selbjornsfjord	RC	0745
SL	Sletterhage Lt	RC	0351
SL	Spurn Lt V	RC	0123
SLO	Saint Louis	Aero RC	1633
SLS	Salinas, Peru	Aero RC	4875
SLS	Salinas, Ecuador	Aero RC	4851
SLT	Sylt	Aero RC	0285
SLU	Saint Lucia	Aero RC	5193
SM	Cabo de Santa Maria Lt	RC	0979
SM	Monrovia	Aero RC	1675
SM	Mys Sukhumiyskiy Lt	RC	1339
SM	Mys Syurkum Aukan Lt	RC	3593
SM	Pte St Mathieu Lt	RC	0859
SM	Sandhammaren Lt	RC	0641
SM	Santa Isabel	Aero RC	1733
SM	Shiono Misaki	RW	3405
SM	St Mawgan	Aero RC	0019
SMA	Santa Maria	Aero RC	1583
SN	Cabo de Sines Lt	RC	0971
SN	Cabo San Sebastian	RC	1023
SN	Ile de Sein N W Lt	RC	0863
SN	Mys Set'-Navolok Lt	RC	3793
SN	Saipan	Aero RC	4417
SN	Sandakan	Aero RC	3859
SN	Sletnes Lt	RC	0807
SNR	Santander	Aero RC	0915
SO	Espiritu Santo	Aero RC	4373
SO	Les Sables d'Olonne, Tour de la Chaume Lt	RC	0881
SO	Olands Sodra Udde Lt	RC	0635
SO	Sochi-Sochinskiy Lt	RC	1335
SP	Cabo Espartel	RC	1531
SP	Sapporo	Aero RC	3489
SP	Start Pt Lt	RC	0011
SPP	Isla San Andres	Aero RC	5439
SPY	Amsterdam/Spijkerboor	Aero RC	0239
SR	Skerries Lt	RC	0033
SR	Stubbenkammer Fog Sig Stn	RC	0425
SRN	Strahan	Aero RC	4135
SS	Sassandra	Aero RC	1193
SS	Simpnasklubb Lt	RC	0205
SSR	Sisters Island	Aero RC	4529
SSX	Samsun	Aero RC	1347
ST	Sakata	RW	3501
ST	Sao Tome	Aero RC	1749
ST	Stevns Klint Lt	RC	0377
ST	Sukkertoppen	RC	6423
STH	Saint Helens	Aero RC	4139
STT	Stott/Bodo S W	Aero RC	0779
STU	Strumble	Aero RC	0031
STX	Saint Croix	Aero RC	5213
SU	South Rock Lt V	RC	0189
SUD	Soudha, Kriti	Aero RC	1243
SUM	Sumburgh, Shetland Is	Aero RC	0085
SUN	Sounion	Aero RC	1257
SV	Sagiek	Aero RC	6261
SV	Salvador	Aero RC	5093
SV	Skagens Rev Lt V	RC	0325

SERVICE DETAILS

Number	Type	Name / Ident	Freq	Emission	Range	Service	Position
							GREAT BRITAIN
0001	RC	**Nab Tr Lt** **NB**—Grouped with 0843					50°40'03"N 0°57'04"W
	Calib Stn	**NB**	312.6	A2	5 miles	0800-0900: 1200-1300 clock time Also on request (see notes)	
0003	RC	**St Catherine's Pt Lt**	291.9	A2			50°34'31"N 1°17'48"W

No	Name	Ident	Range	Seq	Fog	Clear
0003	St Catherine's Pt	**CP**	50	1	Cont	Cont
0159	Casquets	**CS**	50	2	Cont	Cont
0841	Le Havre Lt V[1]	**LH**	50	3	Cont	Cont
0853	Roches Douvres	**RD**	50	4	Cont	Cont
0847	Pte de Barfleur	**FG**	50	5	Cont	Cont
0011	Start Pt	**SP**	50	6	Cont	Cont

[1] Replaced by a Lt Buoy during summer fitted with a low power radiobeacon, as follows:

BG	296.5	A2	10 miles	Cont	

0005	Aero RC	**Bournemouth/Hurn** **HRN**	394	A0, A2	30 miles	Cont	50°47'58"N 1°43'41"W
0007	RC	**Portland Bill Lt**	305.7	A2			50°30'49"N 2°27'19"W

No	Name	Ident	Range	Seq	Fog	Clear
0007	Portland Bill	**PB**	20	1, 3, 5	Cont	Cont
0023	Breakwater Lt V	**BK**	30	2, 4, 6	Cont	Nil

0009	Aero RC	**Berry Hd** **BHD**	318	A0, A2	25 miles	Cont	50°23'42"N 3°29'41"W
0011	RC	**Start Pt Lt** **SP**—Grouped with [illegible]					50°13'19"N 3°38'28"W
0013	RC	**Eddystone Lt**	298.8	A2			50°10'48"N 4°15'52"W

No	Name	Ident	Range	Seq	Fog	Clear
0013	Eddystone	**DY**	20	1, 3, 5	Cont	Nil
0015	Lizard[1]	**LZ**	30	2, 4, 6	Cont	Nil

[1] Calibration transmissions available in clear weather on request (see notes)

0015	RC	**Lizard Lt** **LZ**—Grouped with 0013	49°57'35"N 5°12'04"W

(Caribbean Coast) COLOMBIA

5431	Aero RC	**Barranquilla** **BAQ**	353	A2	1.0 kW	Cont	10°47′ "N 74°52′ "W
5433	Aero RC	**Cartagena/Crespo** **CTG**	255	A2	1.0 kW	Cont	10°26′50"N 75°30′47"W
5435	RC	**Isla Tierra Bomba Lt** **CG**	280	A2	100 miles	For 1 min at H + 00, 03, 06: 30, 33, 36	10°20′33"N 75°34′50"W
5437	Aero RC	**Turbo** **TUR**	234	A2	1.0 kW	Day	8°07′ "N 76°43′ "W[1]

[1] Repd moved to 8°04′36"N 76°44′06"W (Sept 1989)

5439	Aero RC	**Isla San Andrés** **SPP**	387	A1	1.0 kW	Cont	12°35′00"N 81°42′15"W

(Caribbean Coast) PANAMA AND CANAL ZONE

5449	Aero RC	**Cristóbal/France Field** **FTD**	326	A0, A2	2.5 kW	Cont	9°22′00"N 79°52′29"W
5453	RC	**Almirante** **B**	290	A2	Low	Cont from 0500-1300[1]	9°17′26"N 82°23′37"W

[1] From 1300-0500 for 6 min at H + 18 and H + 48. Continuous service is also available during the latter period, on request through Almirante (HPK)

(Caribbean Coast) COSTA RICA

5455	RC	**Limón** (288°–0.9 miles from Isla Uva Lt) **M**	290	A2	50-100 miles	On request[1]	10°00′06"N 83°01′38"W

[1] Through Limón (TIM). Beacon transmits for 10 min at H + 00 and H + 30

5457	Aero RC	**Puerto Limón** **TIKY**	380	A2	0.85 kW	Cont	9°58′39"N 83°02′02"W

NICARAGUA

5465	Aero RC	**Puerto Cabezas** **PZA**	1662			Cont	14°03′ "N 83°23′ "W

HONDURAS

5471	RC	**Tela** (approx. 152°–630 m from Lt J5998) **C**	310	A2	50-100 miles	For 10 min at H + 05 between 0200-1515[1]	(PA) 15°46′51"N 87°27′21"W

[1] Other times on request through Tela (HRC)

5473	RC	**Puerto Cortés—Punta Caballo Lt** **IJ**	310	A2	50-100 miles	For 10 min at H + 10, 40 between 0000-1300[1]	15°51′00"N 87°57′45"W

[1] Other times on request through Puerto Cortés (HRG)

ALPHABETICAL INDEX OF STATIONS

(1) All names appear in this index as they are shown in the list and on charts, e.g., Cape Wrath instead of the previous form Wrath, Cape.

(2) Only stations in the general radiobeacon section appear in this index. Coast Radar Stations and Radar Beacons are not listed as they appear in alphabetical order in their appropriate sections of the list.

(3) The alphabetical order takes no account of diacritical marks etc; e.g. ä and å are treated as "a".

(4) Stations are listed under their proper names, the English equivalents are not given. Glossaries of foreign terms will be found in the Admiralty Sailing Directions.

Name	Type	Number
Aalborg Bugt LT V	RC	0341
Aarhus Front Lt	RC	0353
Aase	Aero RC	0797
Abashiri	RW	3477
Abertay Lt V	RC	0099
Abidjan	RC	1695
Abidjan	R	1699
Abidjan	Aero RC	1697
Abrolhos Lt	RC	5083
Absecon Inlet	RC	5731
Abu Zabi	Aero RC	2099
Acapulco	Aero RC	4765
Accra	Aero RC	1709
Active Pass	RC	4606
Ad Dawhah	Aero RC	3007
Adak	Aero RC	4513
Adelaide	Aero RC	4115
Adele Island Lt	RC	4071
Agadir	Aero RC	1545
Aiyina	Aero RC	1253
Ajaccio/Campo dell'Oro	Aero RC	1079
Ajos	RC	0553
Akhilleonskiy Lt	RC	1327
Akhtarskiy Lt	RC	1325
Akko Lt	RC	1407
Akraberg (Sumbo) Lt	RC	0297
Akrotiri	Aero RC	1381
Akureyri	Aero RC	6607
Akyab	Aero RC	3151
Al-Wejh	Aero RC	2063
Alabat	Aero RC	3821
Albany	Aero RC	4099
Albenga	Aero RC	1109
Albert Head Lt	Calib Stn	4603
Alboran Lt	RC	1006
Alderney	Aero RC	0161
Alert Bay	RC	4585
Alevina	RC	3629
Alexandra Bay	Aero RC	1817
Alexandria	Aero RC	1431
Alexandroupolis	Aero RC	1267
Algiers	RC	1501
Alhoceima	Aero RC	1525
Alicante	Aero RC	1011
Alki Point Lt	Calib Stn	4629
Almagrundet Lt	RC	0609
Almeria	Aero RC	1007
Almirante	RC	5453
Alno/Sundsvall	Aero RC	0589
Amami O Shima	Aero RC	3381
Amapa	Aero RC	5129
Ambon	Aero RC	3999
Amboriz	Aero RC	1783
Ambrose Lt	RC	5747
Amchitka Island	Aero RC	4514
Ameland Lt	RC	0247
Amendola	Aero RC	1171
Amour Point Lt	RC	6167
Ampenan	Aero RC	3957
Amphitrite Pt Lt	RC	4595
Amsterdam/Spijkerboor	Aero RC	0239
Amucuro	Aero RC	5385
Anacapa Island Lt	RC	4713
Anapa Lt	RC	1330
Andenes Andoy	Aero RC	0795
Andoya	Consol	0796
Andravida	Aero RC	1241
Angaur	Aero RC	4411
Angissoq	RC	6443
Anglesey	R	0151
Angmagssalik	R	6471
Anholt	Aero RC	0347
Anholt North Lt V	RC	0345
Anjouan	Aero RC	1892
Antalaha South	Aero RC	1907
Antalya	Aero RC	1365
Antigua	Aero RC	5205
Antofagasta	Aero RC	4907
Aonai Misaki	RW	3493
Aputiteq	R	6471
Aracaju	Aero RC	5095
Aransas Pass Lt	RC	5529
Archipielago de Colon	Aero RC	4855
Ardrossan	Aero RC	4113
Arendal, Hisoy	RC	0711
Arica	Aero RC	4897
Arorae	Aero RC	4387
Arrecife	Aero RC	1609
Ascension Island	Aero RC	1775
Ashburton	Aero RC	4245
Ashe Inlet	RC	6285
Ashizuri Saki Lt	RW	3397
Ashkelon	Aero RC	1415
Assab	Aero RC	2021
Asturias	Aero RC	0923
Auckland	R	4285
Auckland	Aero RC	4215
Augusta-Dromo Giggia Lt	RC	1149
Auki	Aero RC	4045
Avachinskiy	RC	3653
Avalon Harbour	RC	4723
Aveiro	Aero RC	0953
Aveiro Lt	RC	0955
Awarua	R	4285
Axios	RD	1261
Azaiba	Aero RC	2093

Name	Type	Number
Hao	Aero RC	4311
Harmaja Lt	RC	0519
Harstad	R	0813
Hartlen Point	RC	6047
Hatteras Inlet	RC	5663
Heath Point Lt, Anticosti Island	RC	6151
Hegranes	Aero RC	6599
Heka	Aero RC	0513
Hekkingen Lt	RC	0799
Hekura Shima Lt	RW	3507
Hel Lt	RC	0447
Helgoland Lt	RC	0277
Helnes Lt, Magerøy	RC	0805
Helsinki	Calib Stn	0517
Helsinki Lt	RC	0515
Hemsö	RC	0587
Hendanes Lt, Vagsoy	RC	0755
Heng-Ch'un	Aero RC	3289
Herzliya	Aero RC	1413
Hestehoved Lt	RC	0383
Hihifo	Aero RC	4343
Hillsboro Inlet Lt	RC	5621
Hino Misaki Lt	RW	3403
Hiran Point	RC	3101
Hiroo	RW	3465
Hirsholm Main Lt	RC	0331
Hirtsnals Havn Front Lt	RC	0323
Hirtshals Lt	RC	0321
Hjalteyri	Aero RC	6605
Hobart	Aero RC	4137
Hoburg Lt	RC	0625
Hok Tsui	Aero RC	3255
Hokitika	Aero RC	4259
Holierwettern Lt	Calib Stn	0273
Holmengra Lt	RC	0749
Holmogadd Lt	RC	0579
Holsteinsborg	R	6471
Holsteinsborg	Aero RC	6411
Honiara	Aero RC	4047
Hood Point Lt	RC	1843
Hook of Holland	RC	0231
Hornafjordhur	Aero RC	6531
Hornbjarg Lt	RC	6585
Horsburgh Lt	RC	3191
Horta	Aero RC	1575
Hsin-chu	Aero RC	3295
Hua Hin	Aero RC	3219
Hua-lien	Aero RC	3285
Hua-Niao Shan Lt	RC	3305
Hue	Aero RC	3245
Humber	R	0151
Humber Lt V	Calib Stn	0121
Humboldt Bay Front Lt	RC	4671
Husavik	Aero RC	6611
Husum	Aero RC	0283
I of May	RC	0105
I-lan	Aero RC	3283
Ibiza	Aero RC	1033
IJmuiden Front Lt	RC	0237
Il'chevsk Lt	RC	1295
Il'inskiy Lt, Mys Il'i	RC	1311
Ile d'Yeu Main Lt	RC	0679
Ile de Batz	RC	0855
Ile de Groix, Pen Men Lt	RC	0871
Ile de la Giraglia Lt, Cap Corse	RC	1067
Ile de Sein N W Lt	RC	0863
Ile du Corossol Lt	RC	6133
Ile du Pilier Lt	RC	0877

Name	Type	Number
Ile du Planier Lt	RC	1051
Ile Europa	Aero RC	1895
Ile Lavezzi Lt, Bonifacio Strait	RC	1075
Ilfracombe	R	0151
Ilha Berlenga Lt	RC	0959
Ilha da Moela Lt	RC	5067
Ilha Rasa Lt	RC	5071
Ilheus	Aero RC	5089
Iloilo	Aero RC	3833
Inchkeith Lt	Calib Stn	0107
Indian River Inlet	RC	5711
Inebolu	Aero RC	1349
Inhambane	Aero RC	1871
Inubo Saki Lt	RW	3429
Io Shima	Aero RC	4421
Iquique	R	4963
Iquique	Aero RC	4901
Iraklion, Kriti	Aero RC	1265
Irbenskiy Lt V	RC	0469
Iro Saki Lt	RC	3413
Isabela	Aero RC	6311
Isafjordhur	R	6617
Isafjordhur	Aero RC	6577
Ishigaki Shima	Aero RC	3369
Isla de Lobos Lt	RC	5039
Isla de Pascua	R	4299
Isla de Pascua	Aero RC	4297
Isla de Sacrificios Lt	RC	5507
Isla Guafo	RC	4951
Isla Mona	RC	5229
Isla Quiriquina	RC	4937
Isla San Andres	Aero RC	5439
Isla Taboga	Aero RC	4809
Isla Tierra Bomba Lt	RC	5435
Islas de Todos Santos N W Lt	RC	4743
Isle Madame	RC	6061
Iso Saki Lt	RW	3431
Isokari Rear Lt	RC	0535
Isola D'Ustica-Punta Gavazzi Lt	RC	1139
Isola del Tino Lt, La Spezia	RC	1113
Istanbul	Aero RC	1357
Iztapa	Aero RC	4775
Jabal Dhanna	Aero RC	3001
Jaffna	Aero RC	3117
Jakobshavn	RC	6406
Jamnagar	Aero RC	3055
Jan Mayen	Consol	6507
Jan Mayen	Aero RC	6509
Jazirat Das	Aero RC	3003
Jazireh-ye-Khark	Aero RC	3029
Jazireh-ye-Sheykh Sho'eyb	Aero RC	3033
Jersey East	Aero RC	0165
Jersey West	Aero RC	0169
Jidda	Aero RC	2065
Jijel	Aero RC	1491
Jiwani	Aero RC	3039
Joao Pessoa	Aero RC	5105
Johnston Atoll	Aero RC	4431
Jones Inlet	RC	5767
Juan Fernandez	R	4963
Julianehaab	R	6471
Jupiter Inlet Lt	RC	5625
Kaikoura	Aero RC	4239
Kaimana	Aero RC	4009
Kains Island Lt	RC	4589
Kaitaia	Aero RC	4209
Kalamata	Aero RC	1242
Kalbadagrund Lt	RC	0511

EXHIBIT F—Certificate from the Hydrographer of the Navy (British)

954a

GREAT BRITAIN AND NORTHERN IRELAND)
LONDON, ENGLAND) ss.
EMBASSY OF THE UNITED STATES OF AMERICA)

I, Micaela A. Cella Vice Consul of the United States of America residing at London, England, duly commissioned and qualified, do hereby certify that

Francis Michael Pulvermacher

whose signature and official seal are respectively subscribed and affixed to the annexed certificate, was on the date of the signing thereof a Notary Public at ~~HUNTON~~ Somerset, England duly authorized to perform notarial acts, duly appointed and qualified, to whose official acts faith and credit are due; that I have compared the signature of the said

Francis Michael Pulvermacher

on the annexed certificate with a specimen of his signature filed in this Embassy; that I believe his signature to be genuine; that I have compared the impression of the seal affixed thereto with a specimen thereof filed in this Embassy, and that I believe the impression of the seal upon the said original annexed certificate to be genuine.

IN WITNESS WHEREOF I have hereunto set my hand and affixed the seal of the Consular Service of the United States of America at London, England, this Nineteenth day of October. in the year of Our Lord one thousand nine hundred and seventy-three.

Micaela A. Cella

Micaela A. Cella
Vice Consul of the United States of America at London, England.

Service Receipt No: B1553700

Tariff Item No: 48

Fee: $2.50 - £1.05

~~No fee prescribed~~

LND/112
Mar. 73

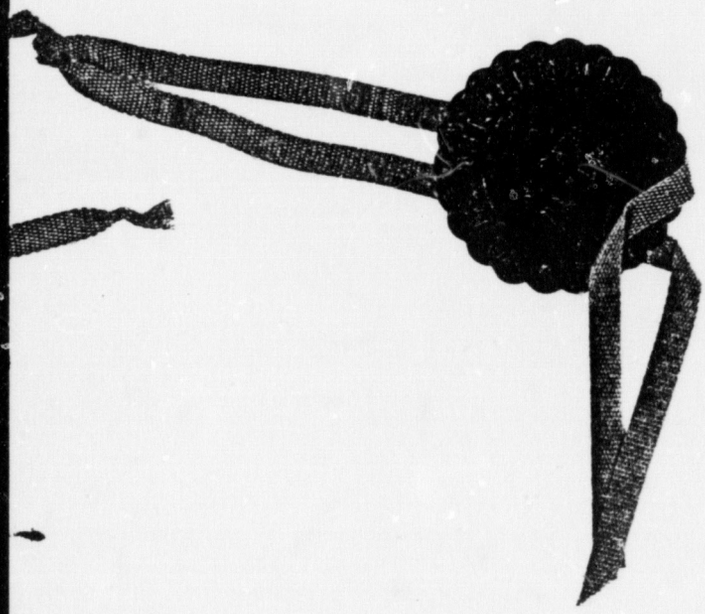
UNITED KINGDOM OF GREAT BRITAIN)
)
AND NORTHERN IRELAND.)
)
COUNTY OF SOMERSET, ENGLAND)

TO ALL TO WHOM THESE PRESENTS SHALL COME

I, FRANCIS MICHAEL PULVERMACHER Notary Public, duly authorised admitted and sworn and practising at the Borough of Taunton in the County of Somerset in the United Kingdom of Great Britain and Northern Ireland DO HEREBY CERTIFY that I was present at Taunton aforesaid on the fifteenth day of October one thousand nine hundred and seventy three and did see Lieutenant Commander ANDREW CATTWG FRANCIS DAVID the Assistant Superintendent of Sailing Directions in the Hydrographic Department of the Ministry of Defence at Taunton aforesaid duly sign the certificate written on the two sheets of paper annexed hereto.

AND I DO FURTHER CERTIFY that the signature "Andrew Cattwg Francis David" thereto subscribed is of the proper hand-writing of the said Lieutenant Commander Andrew Cattwg Francis David.

IN TESTIMONY whereof I have hereunto subscribed my name and affixed my seal of office this fifteenth day of October One thousand nine hundred and seventy three.



Quod veritatem attestor

F. M. Pulvermacher.

Notary Public
Taunton.

HYDROGRAPHIC DEPARTMENT
MINISTRY OF DEFENCE
TAUNTON, Somerset
Telephone: 0823 7900, *ext.*
Telex: 46274

956a

Please address any reply to
THE HYDROGRAPHER OF THE NAVY
quoting:
Your reference:

1. I certify that the following caution was first inserted in the East Coast of Central America and Gulf of Mexico Pilot, 1st Edition 1970, during the 1970 revision of that book.

> "Current - Caution. - Caution should be exercised when passing eastward of Quita Sueno Bank as the current here sets strongly to the westward and on the (the) bank."

This caution did not appear in West Indies Pilot, Vol I, 11th Edition 1956, in which Quita Sueno Bank was previously described. No notice to Mariners was issued, to insert the above caution in the 1956 edition nor was the 1956 edition amended by supplement No. 6 of 1968 or any earlier supplement to include this caution.

2. I certify that the aero radiobeacon at Isla San Andres has never been shown on Admiralty chart 1218. Up to 1965 the policy of this department was to chart marine radiobeacons only. In 1965 it was decided to chart selected aero radiobeacons which could be of use for marine navigation. Because of the large number of Notices to

HYDROGRAPHIC DEPARTMENT
MINISTRY OF DEFENCE
TAUNTON, Somerset
Telephone: 0823 7900, *ext.*
Telex: 46274

Please address any reply to
THE HYDROGRAPHER OF THE NAVY
quoting:
Your reference:

957a

Mariners that would be required to insert such aero radiobeacons on several thousand charts it was also decided that aero radiobeacons would normally only be inserted on charts as and when they were revised by new editions. Since Admiralty chart 1218 has not been revised by a new edition since 1965, the aero radiobeacon at Isla San Andres has not yet been inserted on that chart.

3. I certify that the 1971 edition of Admiralty List of Radio Signals, Volume 2, was available at Taunton for issue to Mariners from 6th November 1971.

Andrew Cathwg Francis David

(A.C.F. David)
Lieutenant Commander, Royal Navy,
Assistant Superintendent of
Sailing Directions,
Hydrographic Department,
Ministry of Defence,
Taunton,
ENGLAND.

EXHIBIT G—Sailing Directions for the East Coasts of Central America and Mexico (H.O. Pub. 20) (U.S.A.)

958a

H. O. Pub. 20
(Formerly No. 130)

SAILING DIRECTIONS
for the
EAST COASTS OF CENTRAL AMERICA AND MEXICO

Includes north coast of Colombia

Fifth Edition
1952

Published by the U. S. Naval Oceanographic Office
under the authority of the Secretary of the Navy

United States
Government Printing Office
Washington : 1952

Change 11

For Sale by authorized Sales Agents of the U. S. Naval Oceanographic Office
Price, including ring binder $5.50
Contents only (without binder) $4.00

On the storm track, in rear of center.—Avoid the center by the best practicable route, having due regard to the tendency of cyclones to recurve to the southward and eastward.

The above rules depend, of course, upon having sea room. In case land interferes, a vessel should heave to, as recommended for the semicircle in which she finds herself.

ROUTES

GENERAL REMARKS

1-51 The important overseas routes from and to the principal ports on the east coasts of Central America and Mexico are described herein. The coastal tracks within this area are described in the chapter related to a particular part of the coast.

In general the routes are as direct as safe navigation permits, however, in some instances a divergence is made from the direct track to take advantage of favorable currents or minimize the effect of adverse currents. A divergence is also made in some instances to avoid the adverse effect of intensified trade winds. It must not be inferred that recommendations in this section are the shortest distance between ports, nor do they necessarily represent adopted or established sea lanes. Where the same route may be followed in either direction, the reverse route is not described. When not stated to the contrary, the route between two points is by rhumb line.

A route chart, contained in an envelope in the back of the book, outlines the primary routes described in the following text, and the distances are shown for comparative purposes. For additional distances, see H. O. Pub. 151, Distances between Ports.

PLAN

1-52 The routes in this volume are divided into the following sections and describe the navigation from Cristobal, Puerto Barrios, and Puerto Tampico to the following areas:

1. To United States Gulf and Atlantic ports and Cabot Strait
2. To North European ports
3. To the Mediterranean Sea
4. To ports on the east coast of South America
5. To South African ports
6. To ports in the Caribbean Sea.

CRISTOBAL, PUERTO BARRIOS, AND PUERTO TAMPICO TO UNITED STATES GULF AND ATLANTIC PORTS AND CABOT STRAIT

1-53 CRISTOBAL TO GALVESTON.—From the breakwater steer for a position about 11 miles westward of Isla de Providencia thence to 16°00′ N., 81°58′ W., thence to a position about 8 miles north-northeastward of Isla Contoy, and thence direct to destination.

The distance is 1,495 miles.

CRISTOBAL TO NEW ORLEANS.—Follow the Cristobal-Galveston route to 16°00′ N., 81°58′ W., thence to a position in Yucatan Channel about 6 miles west-southwestward of Cabo San Antonio, and thence direct to destination via South Pass.

The distance is 1,389 miles.

Alternate (north-bound only).—Steer for a position about 11 miles northwestward of S. W. Cay on Serrana Bank, thence to a position about 46 miles eastward of the northern end of Isla de Cozumel, and thence direct to destination via South Pass.

The distance is 1,414 miles.

Vessels use this route to avoid, as much as possible, the dangers that lie on Miskito Bank, and to obtain the most favorable current in the Yucatan Channel.

CRISTOBAL TO NEW YORK.—Steer for a position about 5 miles east-northeastward of Navassa Island, thence to a position in Windward Passage about 8 miles southeastward

the charted depths in the western part of this bank are from about 4 to 10 fathoms, numerous live coral heads exist near the western and southwestern edge of the bank. The sea breaking over the reef on its eastern side is visible several miles farther than the cays that stand on it. Mariners are advised to use extreme caution in the vicinity of Serrana Bank, because of the strong currents.

Southwest Cay (14°16′N., 80°24′W.), 32 feet high, lies on the southwestern end of the reef on this bank and is the largest cay of the few on Serrana Bank. A light is shown on the western side of this cay. The light structure is reported to be equipped with a radar reflector. Southwest Cay has been reported to give good radar returns up to 10 miles.

Eclipse Rock, with 2 1/2 fathoms over it, is a steep-to rock lying about 800 yards west-southwestward of Southwest Cay.

There is anchorage about 1/2 mile north-northwestward of Southwest Cay in 7 to 9 fathoms, sand.

North Cay, nearly 13 1/2 miles northeastward of Southwest Cay, lies on the northern end of the reef and is small and low. An object resembling a light pylon was reported (1932) on or near North Cay. It should not be mistaken for the light structure on Southwest Cay.

A reef, which is visible only during northerly winds or strong trade breezes, extends about 3 miles from the cay.

A depth of 10 fathoms was reported (1968) about 11 miles westward of North Cay.

SOUTHEASTERN SIDE OF SERRANA BANK.—A steep-to reef extends about 9 miles northeastward from Southwest Cay. It is somewhat protected by windward reefs and not always visible. A ledge, 2 feet high, stands on the edge of the reef about 6 miles northeastward of Southwest Cay, and about 1 1/2 miles farther northeastward is a dry sandbank.

South Cay Channel (14°21′N., 80°15′W.), about midway on the southeastern side of Serra Bank, is about 600 yards wide. A cay lies on each side of the entrance and one faces the entrance from the northward. The channel has depths of 4 to 7 fathoms. Inside the reef several 2 fathom patches must be avoided. Anchorage may be taken in about 4 1/2 fathoms, 1 mile northeastward of the channel entrance, or just within the entrance in 7 fathoms, midway between the cays.

East Cay Channel, 3 miles eastward of South Cay Channel, is about 1/2 mile wide and has depths of 7 to 10 fathoms. East Cay, 3 feet high, is on the west side of the channel. Close north-northeastward of East Cay is a group of rocks and farther northward is a dry sandbank. Anchorage may be taken by small craft in 7 to 9 fathoms just within the entrance about 3/4 mile northeastward of East Cay.

TIDES AND CURRENTS.—The mean high-water interval is 4 h.; mean range is 1.6 feet, spring range 2 feet. The current sets in and out of the channels at a rate of 1 1/2 to 2 knots.

QUITA SUENO BANK

5-10 Quita Sueno Bank (southern end, 14°01′N., 81°15′W.) lies with its southern end about 39 miles north-northeastward of Isla de Providencia and is very steep-to. This bank, as defined by the 100-fathom curve, extends about 34 miles northward, has a maximum width of about 13 1/2 miles, and, with the exception of the extensive reef on it and several detached dangers, has general depths of 6 to about 31 fathoms.

From a position about 5 miles southward of the northern edge of the bank a reef that dries in places extends about 23 miles southward along the eastern part of the bank; its greatest breadth, 6 miles, lies about midway between its extremities. Soundings of 7 to 15 fathoms were obtained about 4 to 7 miles eastward of the eastern edge of the bank. A depth of 7 fathoms lies 8 miles southeastward from Quita Sueno Bank Light. A depth of 10 fathoms has been reported (1967) 13 1/2 miles northward from the same light. A light is shown on the northern edge of the reef. The light structure is equipped with a radar reflector.

Wrecks lie 10 miles and 15½ miles southward of Quita Sueno Bank Light. Dangerous wrecks lie sunk 12 miles and 21½ miles southward of the same light.

The only visible stranded wrecks lie about 9½ miles and 12½ miles southward of Quita Sueno Light.

DANGERS.—A shoal, on which depths of 17 to 22 feet were obtained, lies detached from Quita Sueno Bank in a position about 14 miles west-northwestward of the northern edge of the reef. A vessel struck a coral head about 14 miles southwestward and a dangerous sunken rock is charted about 19 miles south-southwestward of the northern edge of the reef. It seems probable that another unsurveyed reef exists westward of Quita Sueno Bank. A depth of 10 fathoms was reported (1964) to lie 38 miles west-northwestward of Quita Sueno Bank Light.

There is good anchorage in 10 to 15 fathoms, clear coral sand, westward of the rocky ground that lies near the middle of the reef.

Caution should be exercised when passing eastward of Quita Sueno Bank as the current here sets strongly to the westward and on to the bank.

SERRANILLA BANK

5-11 Serranilla Bank (western end, 15°54′N., 80°06′W.), the easternmost of the outlying features described within this volume, lies with its western end about 188 miles east-northeastward of Cabo Gracias a Dios and its southern end about 88 miles north-northeastward of Southwest Cay of Serrana Bank. This bank, as defined by the 100-fathom curve, is about 24 miles long, east and west, has a maximum width of about 20 miles, and is very steep-to. With the exception of the shoal area in the vicinity of the cays on the eastern and southern part of the bank, there are general depths of 6 to about 20 fathoms.

There is no perceptible tidal current on this bank, but a current generally sets west-northwestward at a rate of 1/4 to 1 knot.

East Cay (15°52′N., 79°44′W.), the easternmost above-water feature on Seranilla Bank, is a small bush-covered cay, 7 feet high, that lies about 3 miles westward of the eastern edge of the bank. Foul ground, consisting of reefs, some awash, and coral heads, extends about 2 1/2 miles northward through northeastward from the cay.

Northeast Breaker, a coral ledge with a rock awash on its southern edge, lies about 1 mile within the edge of the bank about 3 miles northeastward of East Cay and is the easternmost danger on Serranilla Bank.

Beacon Cay, the southernmost and largest of the three cays on Serranilla Bank, lies about 1 3/4 miles within the edge of the bank about 7 1/2 miles southwestward of East Cay. It is 8 feet high, covered with samphire grass, and had a rough beacon of coral stones erected on its western end in 1835.

There are numerous coral heads, reefs, and drying rocks in the area northward of a line connecting East and Beacon Cays and within the limits of lines drawn about 4 1/2 miles northwestward from each cay; a small 7-foot cay stands in this foul area nearly 2 miles westward of East Cay.

There is good anchorage in 6 fathoms about 1 mile northwestward of Beacon Cay, but a good lookout should be kept for patches.

West Breaker, a dangerous ledge about 2 feet high, lies about 1/2 mile within the edge of Serranilla Bank nearly 8 miles westward of Beacon Cay and is the westernmost danger on the bank; the sea breaks on it.

ROSALIND BANK

5-12 Rosalind Bank, an extensive bank with depths of 4 to 20 fathoms, lies with its southern end about 14 miles westward of Serranilla Bank. It is about 60 miles long, north-northwest-south-southeast, has a maximum width of about 35 miles, and has regular soundings over coral sand and shells. About 1 mile within the southeastern edge of this bank is a ledge on which are several 4-fathom patches.

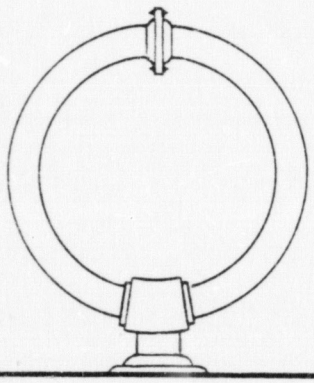
A depth of 6 fathoms was reported (1943) to exist in 16°03′N., 80°36′W., and a similar depth was reported (1922) in 16°28′N., 80°41′W. In 1951 a depth of 10 fathoms was reported to lie within 20 miles northward of the northwestern end of the bank.

The current generally sets strongly northwestward over this bank. Sometimes it attains a velocity of 1 1/2 knots, and on striking the ledge at the southeastern end it causes a race, which has the appearance of breakers.

EXHIBIT H—Radio Navigational Aids (H.O. Pub. 117A)
(U.S.A.)

H.O. PUB. NO. 117 A

962 ∞



CAUTION

Plans for air defense of the Continental United States may require temporary suspension of the operation of certain electronic aids to navigation with little or no advance notice.

RADIO NAVIGATIONAL AIDS

ATLANTIC AND MEDITERRANEAN AREA

Published by the U. S. Naval Oceanographic Office under the authority of the Secretary of the Navy.

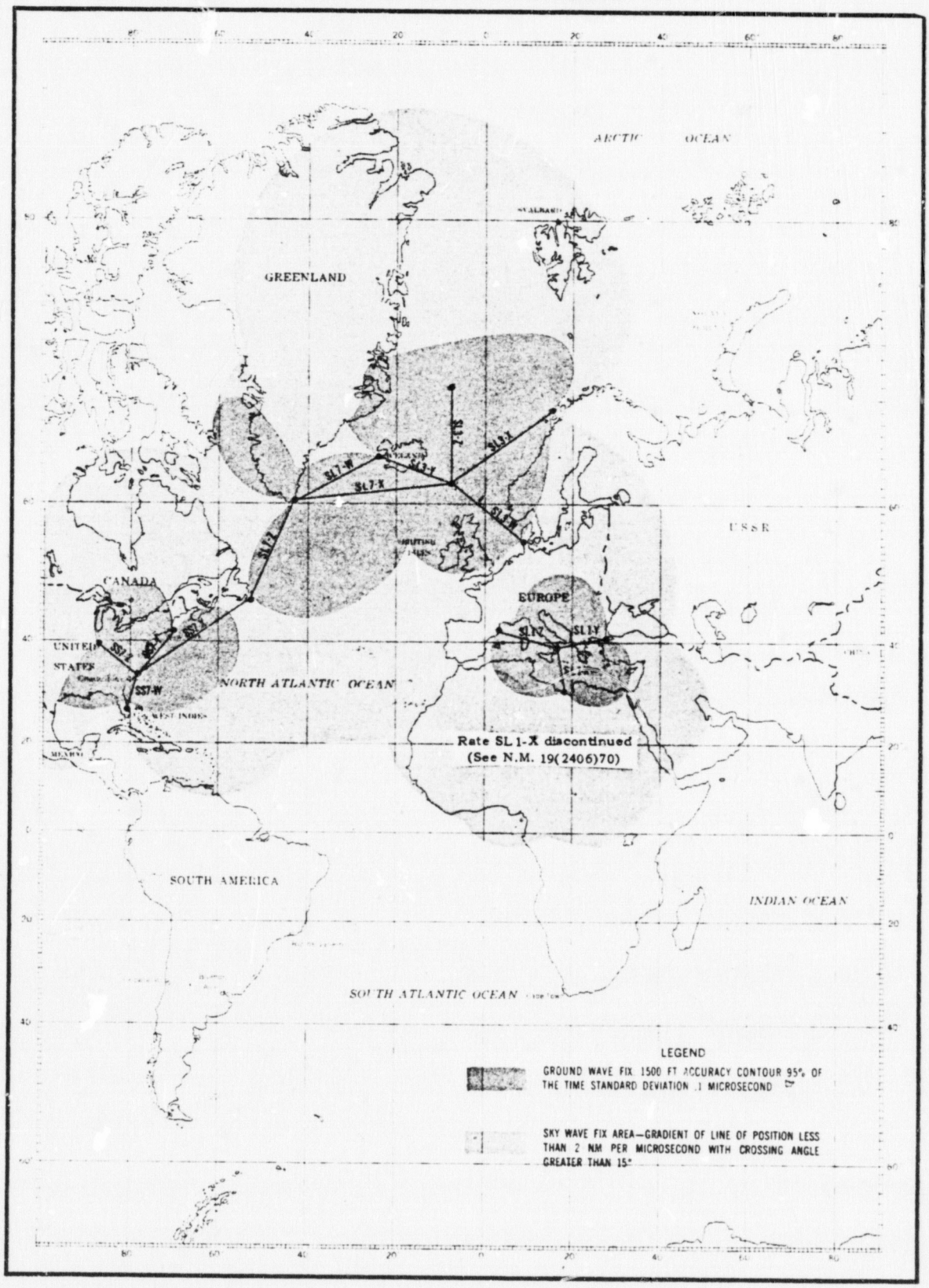
United States
Government Printing Office
Washington: 1967

Price: Including ring binder $5.00
Contents only (without binder) 3.50
Each Change ..... .50

(Chg 15)

963a

LORAN-C COVERAGE DIAGRAM



III

EXHIBIT L—Admiralty List of Lights Vol. J., 1971
(British)

964ω

Admiralty

LIST OF LIGHTS

and Fog Signals

VOLUME **J** 1971

WESTERN SIDE OF NORTH ATLANTIC OCEAN

FROM MAINE TO CABO ORANGE, INCLUDING GULF OF MEXICO AND CARIBBEAN SEA

Corrected to 15th May, 1971

© *Crown Copyright 1971*

6009	— **French Harbour**	16 23·5 86 23·0	Fl.W. 3·0 sec.	..	**15**	Mast 30 **9**	
6010	Isla Guanaja. Pond Cay. Off E. end	16 26·3 85 54·5	Fl.W. 3·0 sec.	..	2	Metal column 30 **9**	
	SWAN ISLANDS						
6016	— **Great Swan Island.** Near W. end (US)	17 24 83 56	Aero Fl.W. 5·0 sec.	70 **21**	**28** *14*	..	Fl.R. 1·5 sec. & 2 F.R. (vert.) on 91 m. tower 1 M. E.

CENTRAL AMERICA — NICARAGUA

	QUITA SUEÑO BANK						
6028	— N. end (PC)	14 29 81 08	Fl.W. 20·0 sec.	45 **14**	11	Black and white ◇ on white tower, black lantern	*fl 2·0* Lights operate independently and may flash simultaneously or successively: therefore the interval between the flashes may be irregular
		..	Fl.W. 3·0 sec.	**14**	11	Same structure	*fl 0·3*
6034	— Serrana Bank. South-west Cay (PC)	14 16 80 24	Fl.W. 5·0 sec.	**22**	12	Red pyramidal framework tower on tank	*fl 0·5* Lights operate independently and may flash simultaneously or successively: therefore the interval between the flashes may be irregular
		..	Fl.W. 30·0 sec.	**22**	12	Same structure	*fl 3·0*

965a

EXHIBIT P—Irish Spruce Order Form Dated January 3, 1972

IRISH SHIPPING LTD.

CHARTER HOUSE

To avoid delay in payment of accounts it is essential that this copy, duly checked and signed, be forwarded to office immediately after receipt of goods.

OFFICE COPY

966a

P No - 9699

DECK

3/1/72

[illegible]

Irish Shipping Ltd.

S.S. "Irish Spruce"

[illegible]

1 EACH British Admiralty Charts

Numbers:- 3827, 275, L(DS) 2361, L(DS) 1752, L(DS) 1895, 2127, 3617, 1578 1299, 2133, 142, 656, L(DS) 122, 132, L(DS) 1310, 3081, 3950 2542, L(DS) 2342, 2821 1867 L(DS) 2451, L(DS) 1406, 2260, 527, L(DS) 1852, 5310, L(DS) 307, 3273, 779, 2412, 2453, 2192, 762, 124

Admy Chart Catalogue 1972

Tide Tables. Vol III 1972

Annual Summary Not. To Mar. 1972

List of Lights Vol B (N.P. 75)
" " " Vol H (N.P. 81)
" " " Vol J (N.P. 82)
" " " Vol K (N.P. 83)
" " " Vol L (N.P. 84)

List of Radio Signals Vol III, Part Radio Direction Finding Stations (N.P. 275(6))

List of Radio Signals Vol II 1971. Radio Beacons (N.P. 275(2))

Radio Beacon Diagrams (N.P. 275(2A))

Mariners Handbook, New Ed. (N.P. 100)

1 EACH. Pilot Books

Bay of Biscay Pilot (N.P. 29) 5th Ed.

Mediterranean Pilot Vol III (N.P. 77) 3rd Ed.

East Coast of Central America & Gulf of Mexico Pilot (N.P. 63A) 1st Ed.

Supplements to Pilot Books

No 2 to Persian Gulf Pilot (N.P. 63a)

No 6 to W. Coast Central America & S. Pilot. (N.P. 83)

No 4 Newfoundland Pilot (N.P. 50(2))

No 1 St. Lawrence Pilot (N.P. 65)

No 7 S.E. Alaska Pilot (N.P. 154)

No 7 Artic Pilot Vol I (N.P. 102)

No 1 S. America Pilot Vol III (N.P. 77a)

No 7 Norway Pilot Vol II (N.P. 56a)

No 7 North Sea Vol I (N.P. 52a)

No 1 Pacific Is. Pilot Vol III (N.P. 62a)

No 3 Korea, Siberia, Pilot (N.P. 153)

No 7 W. Coast England (N.P. 37a)

No 6 Newfoundland Vol I (N.P. 50(6))

No 6 Norway Pilot Vol II (N.P. 57(6))

No 3 Bering Sea (N.P. 23a)

No 4 Norway Pilot Vol II B (N.P. 57(4))

No 2 Irish Coast Pilot (N.P. 103)

No 5 Mediterranean Pilot Vol II (N.P. 77a)

No 7 to Artic Pilot Vol III (N.P. 102a)

N.B.:- Nautical Almanacs for 1972 & Tide Tables for Eastern Atlantic & Indian Oceans Not Required. All these were obtained at San Francisco on 5th Dec. 1971.

[signature]

Thomas Black & Co.

EXHIBIT S—Bowditch (1966)

967a

H.O. Pub. No. 9

AMERICAN PRACTICAL NAVIGATOR

AN EPITOME OF NAVIGATION

ORIGINALLY BY

NATHANIEL BOWDITCH, LL.D.

1966—Corrected Print

PUBLISHED BY THE
U.S. NAVAL OCEANOGRAPHIC OFFICE
UNDER THE AUTHORITY OF THE
SECRETARY OF THE NAVY



U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1966

For sale by authorized Sales Agents of the U.S. Naval Oceanographic Office, also the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

LORAN-A COVERAGE DIAGRAM

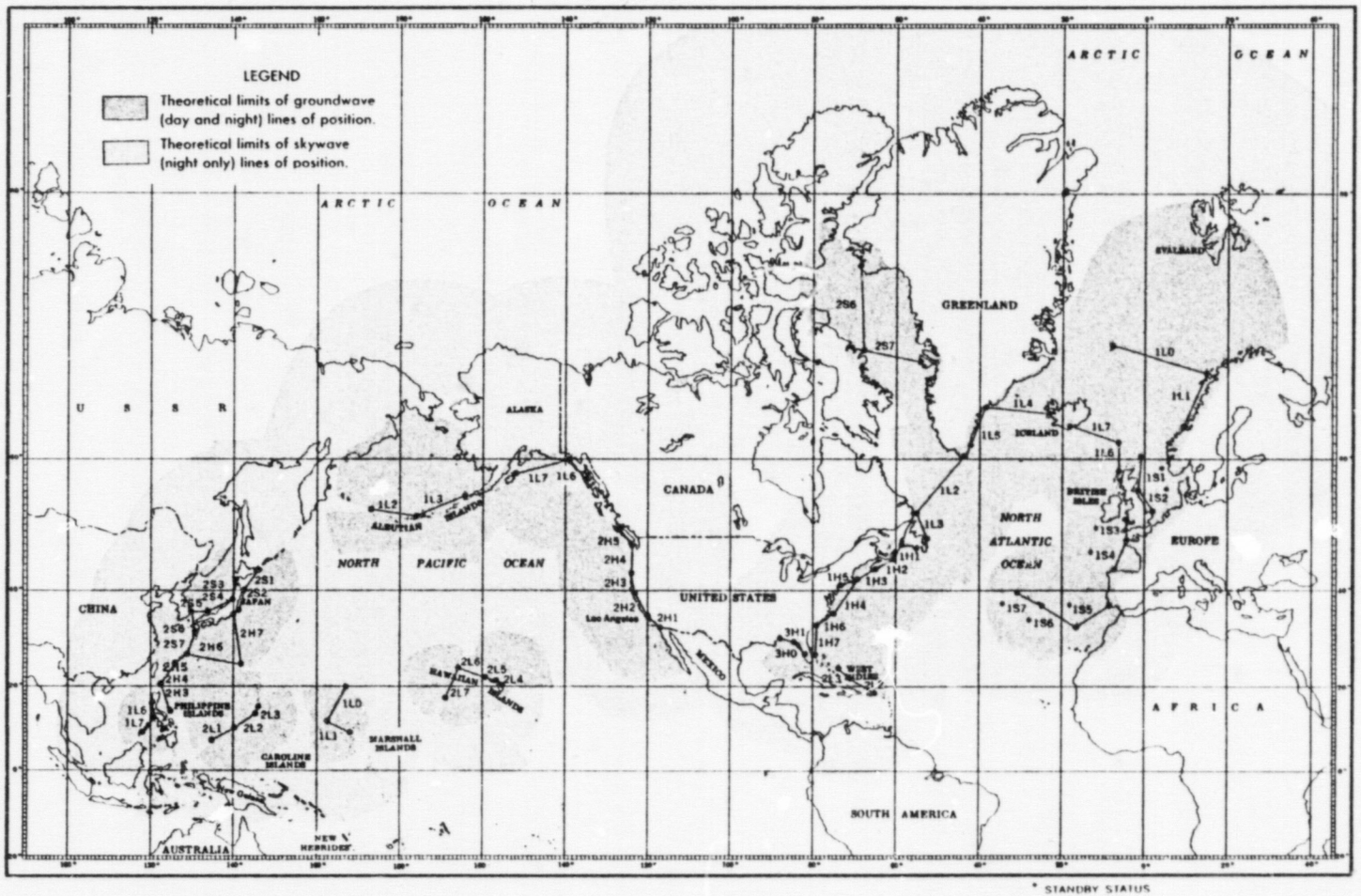


FIGURE 1302a.—LORAN-A coverage.

EXHIBIT V—Notice to Mariners No. 1449/71

ADMIRALTY NOTICES TO MARINERS

1449. ADMIRALTY PUBLICATIONS — First Edition of East Coasts of Central America and Gulf of Mexico Pilot (N.P. 69A).

A first edition of East Coasts of Central America and Gulf of Mexico Pilot dated 7th August, 1970, has been published, price £1·75 net.

The following Admiralty Notices to Mariners issued since going to press affect this book:—

1970. 1432, 1791.

1971. 56, 287, 317, 349, 533, 817, 934, 1060, 1074, 1199, 1202, 1203, 1204, 1374.

This book together with South America Pilot Vol. IV First Edition 1969 (N.P. 7A), already published, supersedes West Indies Pilot Vol. I Eleventh edition 1956 (N.P. 70).

Hydrographic Department. (*H. 2230/70.*)

***1450(P). ENGLAND, E. COAST — Thames Estuary — Barrow Deep — Light-Vessels to be replaced by Light-Buoys.**

On about 20th October, 1971, high focal plane light-buoys will be established as follows:—

(*a*) *Barrow Deep*, black and white vertical stripes, *Iso. 10 sec. Horn* (*4*) at 51° 41′ 57″ N., 1° 21′ 20″ E.

(*b*) *Mid Barrow*, red and white vertical stripes, *Iso. 5 sec. Horn* (*2*) at 51° 35′ 00″ N., 1° 10′ 27″ E.

The light-vessels, will be withdrawn.

Charts which will be affected.—1607 & L(D5) 1607 (*b*)—1975 & L(D5) 1975—1610 & L(D5) 1610—1406, & L(D5) 1406.

Light List Vol. A/70, 2163, 2162.

Trinity House Notice 68/71. (*H. 5845/68.*)

1451(T). SCOTLAND, W. COAST — Firth of Clyde — Lower Loch Long — Salvage Operations, marked by Light-Buoy.

Operations are in progress to recover four oil rig leg-sections in position 56° 00′ 16″ N., 4° 52′ 25″ W. A green spherical light-buoy, *Occ. G. 5 sec.*, has been established.

Charts temporarily affected.—3746—1994.

Clyde Port Authority Notice 21/71. (*H. 1270/71.*)

1452(T). ENGLAND, S. COAST — The Solent — Stokes Bay — Light-Buoys established.

Spherical light-buoys, red and yellow vertical stripes, *Gp. Fl. (3) 20 sec.*, have been established in the following positions for a period of about 6 months:—

(*a*) 265° 2,300 feet } from Gilkicker Point light

(*b*) 277° 7,100 feet } (50° 46′ 25″ N., 1° 08′ 20″ W. approx.).

Charts temporarily affected.—2625 (*a*)—394 & L(D5) 394

Portsmouth Local Notice 38/71. (*H. 3339/68.*)

Taunton.
18*th September*, 1971.

G. P. D. HALL, *Rear-Admiral,*
Hydrographer of the Navy.

Dd. 818790 475 9/71 J.T. & S. Ltd. Gp. 405

EXHIBIT W—Weekly Edition No. 37 Notice to Mariners 1971

970a

No. 37. WEEKLY EDITION

The substance of these Notices which are for the use of **H.M. Ships and Merchant Ships**, should be inserted on the Charts affected. Sections IV, V and VI should be cut up and pasted in the appropriate Admiralty Publications. Permanent Notices in Section II are not to be cut up, but the books are to be annotated in the margin or corrected in manuscript. Temporary and Preliminary Notices may be filed for easy reference.

ADMIRALTY NOTICES TO MARINERS

Week ending 18th September, 1971.

Notices Nos. **1405** *to* **1456; NZ 97, 100.**

Geographical positions refer direct to the graduations of the largest scale chart unless otherwise stated. Bearings are referred to the true compass and are reckoned clockwise from 000° (North) to 359°; those relating to lights are from seaward. Visibility of lights is that in clear weather. The abbreviation "(U)" for "Unwatched" is no longer being inserted on Admiralty charts nor in Admiralty List of Lights. Depths are with reference to datum of largest scale chart. Heights are above mean high water springs, or mean higher high water, as appropriate. The capital letter **(P)** *or* **(T)** *after the number of any Notice denotes Preliminary or Temporary respectively.*

NOTE.—Blocks and Notes are shown after Section IV.

CONTENTS

I. Index.

II. Admiralty Notices to Mariners.

III. Navigational Warnings.

†IV. Amendments to NEMEDRI, CHINPACS and Notice to Mariners No. 18 (Areas dangerous due to Mines).

V. Corrections to Admiralty List of Lights and Fog Signals.

VI. Corrections to Admiralty List of Radio Signals and Notices to Mariners Nos. 3, 3A & 3B (Official Radio Messages to British Merchant Ships).

† Mined areas are not printed on charts, except in the Baltic.

Taunton.

G. P. D. HALL, *Rear-Admiral,*
Hydrographer of the Navy.

Mariners are particularly requested to notify the Hydrographer of the Navy, Hydrographic Department, Ministry of Defence, Taunton, Somerset, immediately on the discovery of new dangers or suspected dangers to navigation, and of changes or defects in aids to navigation.

Copies of these Notices can be obtained **gratis** *by Masters of foreign going ships from Mercantile Marine Offices in the United Kingdom. Copies may also be inspected at British Commonwealth Government Shipping Offices and at British Consulates. See Annual Notice No. 14.*

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NUMERICAL INDEX TO ADMIRALTY NOTICES TO MARINERS AND CHART FOLIOS

Edition No. 37 *Week ending 18th September, 1971*

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*1405	3	3	102
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NZ 97	10	—	—
NZ 100	10	—	—

*Indicates Notice to Mariners based on original information.

Attention is drawn to the Annual Summary of Admiralty Notices to Mariners and to the Monthly List of Temporary and Preliminary Notices in force.

II

(5) New Editions and Large Corrections to be Published Shortly.

Chart.		Charts superseded.
3371 L(D5) 3371	North Sea, Gabbard and Galloper Banks to Hook of Holland.	Large Correction
3509 L(D9) 3509	North Sea, Germany and Netherlands, Die Ems.	do.

1449. ADMIRALTY PUBLICATIONS — First Edition of East Coasts of Central America and Gulf of Mexico Pilot (N.P. 69A).

A first edition of East Coasts of Central America and Gulf of Mexico Pilot dated 7th August, 1970, has been published, price £1·75 net.

The following Admiralty Notices to Mariners issued since going to press affect this book:—

1970. 1432, 1791.

1971. 56, 287, 317, 349, 533, 817, 934, 1060, 1074, 1199, 1202, 1203, 1204, 1374.

This book together with South America Pilot Vol. IV First Edition 1969 (N.P. 7A), already published, supersedes West Indies Pilot Vol. I Eleventh edition 1956 (N.P. 70).

Hydrographic Department. (*H. 2230/70.*)

***1409. ENGLAND, E. COAST — Thames Estuary — N.E. Mouse — Light-Buoy altered.**

The characteristic of N.E. Mouse light-buoy (51° 32′ 10″ N., 1° 02′ 40″ E. approx.), is to be amended to *Gp. Fl. (2) R. 5 sec.*, with ⌒ above.

Charts [*Last correction*].—**1607 & L(D5) 1607** [*1283/71*].
Trinity House Notice 74/71. (*H. 5845/68.*)

***1429. ENGLAND, E. COAST — Great Yarmouth — Conspicuous Chimney demolished.**

The Ch (180) (conspic), in position 52° 35′ 30″ N., 1° 43′ 55″ E. (approx.), is to be expunged.

Charts [*Last correction*].—**1536 & L(D5) 1536** [*1129/71*].
H.M. Survey Ship *Echo* Hyd. Note 1/71. (*H. 4099/71.*)

***1405. SCOTLAND, W. COAST — Loch Fyne — The Narrows — Glas Eilean — Light established.**

A light, *Fl. R. 5 sec. 38 ft 7 M.*, is to be inserted in position 56° 01′ 06″ N., 5° 21′ 06″ W.

Charts [*Last correction*].—**2381** [*62/69*]—**2382** [*87/71*]—**2131** [*421/71*].
Light List Vol. A/70, 4310. W.C. of Scotland Pilot 1958 p. 119.
Clyde Port Authority Notice 19/71. (*H. 3840/70.*)

EXHIBIT BB—1972 British List Radio Signals

ADMIRALTY LIST OF

973a

RADIO SIGNALS

VOLUME 2

1972

RADIO DIRECTION FINDING STATIONS
RADIOBEACONS
COAST RADAR STATIONS
RADAR BEACONS

This volume should be corrected each week from Section VI of the Weekly Edition of Admiralty Notices to Mariners until superseded

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PUBLISHED BY THE HYDROGRAPHER OF THE NAVY

(Caribbean Coast) COLOMBIA

31	Aero	**Barranquilla**					10°47′ "N 74°52′ "W
	RC	**BAQ**	353	A2	1.0 kW	Cont	

974 ω

33	Aero	**Cartagena/Crespo**					10°26′50"N 75°30′47"W
	RC	**CTG**	255	A2	1.0 kW	Cont	

35	RC	**Isla Tierra Bomba Lt**					10°20′33"N 75°34′50"W
		CG	280	A0, A2	0.1 kW	For 1 min at H + 00, 03, 06, 09: 30, 33, 36, 39 between 1000 and 2400	

37	Aero	**Turbo**					8°07′ "N 76°43′ "W[1]
	RC	**TUR**	234	A2	1.0 kW	Day	

[1] Repd moved to 8°04′36"N 76°44′06"W (Sept 1969)

39	Aero	**Isla San Andrés**					12°35′00"N 81°42′15"W
	RC	**SPP**	387	A1	1.0 kW	Cont	

(Caribbean Coast) PANAMA AND CANAL ZONE

49	Aero	**Cristóbal/France Field**					9°22′00"N 79°52′29"W
	RC	**FTD**	326	A0, A2	2.5 kW	Cont	

53	RC	**Almirante**					9°17′26"N 82°23′37"W
		B	290	A2	Low	Cont from 0500-1300[1]	

[1] From 1300-0500 for 6 min at H + 18 and H + 48. Continuous service is also available during the latter period, on request through Almirante (HPK)

(Caribbean Coast) COSTA RICA

455	RC	**Limón** (288°–0.9 miles from Isla Uva Lt)					10°00′06"N 83°01′38"W
		M	290	A2	50-100 miles	On request[1]	

[1] Through Limón (TIM). Beacon transmits for 10 min at H + 00 and H + 30

457	Aero	**Puerto Limón**					9°58′39"N 83°02′02"W
	RC	**TIKY**	380	A2	0.85 kW	Cont	

NICARAGUA

465	Aero	**Puerto Cabezas**					14°03′ "N 83°23′ "W
	RC	**PZA**	1662			Cont	

HONDURAS

471	RC	**Tela** (approx. 152°–630 m from Lt J5998)					(PA) 15°46′51"N 87°27′21"W
		C	310	A2	50-100 miles	For 10 min at H + 05 between 0200-1515[1]	

[1] Other times on request through Tela (HRC)

473	RC	**Puerto Cortés–Punta Caballo Lt**					15°51′00"N 87°57′45"W
		U	310	A2	50-100 miles	For 10 min at H + 10, 40 between 0000-1300[1]	

[1] Other times on request through Puerto Cortés (HRG)

MAGISTRATES REPORT
72 Civ. 656

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

975 ω

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	72 Civ. 3199
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, - against - S.S. IRISH SPRUCE, her engines, tackle, etc., - and against - IRISH SHIPPING LTD., Defendants.	72 Civ. 656
	SPECIAL MASTER'S REPORT[1]

The wreck of the S/S IRISH SPRUCE lies on the remote Quita Sueno Bank in the western Caribbean, 120 miles east of the coast of Nicaragua. Quita Sueno means "troubled sleep", and that is about all that remains for the once proud IRISH SPRUCE.[2] When she ran aground at 3:29 a.m. on January 27, 1972, the vessel and most of its cargo were lost.[3] (Fortunately, there were no injuries among the crew -- all of whom were saved.) This action seeks to find why the S/S IRISH SPRUCE stranded.[4]

Contentions of the Parties

The owner and operator, Irish Shipping Ltd.[5] ("owners")

seek exoneration from liability for the lost cargo, contending that the vessel was lost due to navigational error, which is a statutory exemption under The Carriage of Goods By Sea Act, 46 U.S.C. §1304, or a limitation from liability under 46 U.S.C. §183, as being incurred without the privity or knowledge of the owner.

The cargo claimants[6] ("cargo") contend that the loss was not due to navigational error, but that even if it were, the navigational error was either caused or contributed to by the owners' failure to exercise due diligence to make the vessel seaworthy (thereby making it liable), citing, inter alia, Waterman Steamship Corp. v. Gay Cottons, (The Chickasaw), 414 F.2d 724 (9th Cir. 1969); Avera v. Florida Towing Corp., 322 F.2d 155 (5th Cir. 1963); The Clevco, 154 F.2d 605, 613 (6th Cir. 1946).

Also involved is a time charterer, Compania Peruana de Vapores,[7] against whom the cargo interests have filed claims. The charterer supports the shipowner's position that the cause of the loss was an exempted peril, but, contingently, claims indemnity from the shipowners in the event that it is found that its failure to exercise due diligence to make the vessel seaworthy caused the loss. (The charterer also seeks the value of its bunkers, stores and equipment aboard the vessel at the time of the stranding.)

The Final Voyage

The fateful voyage of the S/S IRISH SPRUCE commenced from ports on the west coast of South America in January of 1972. The ship was carrying cargo destined for New Orleans and other

United States Gulf ports. She passed through the Panama Canal on January 25, 1972. Between the Panama Canal and the Gulf of Mexico lies the western part of the Caribbean Sea, filled with treacherous shoals and reefs. Despite the heavy marine service through these waters, these hazards to navigation are poorly marked and inadequately serviced.[8]

From the Canal to the Yucatan Pass (which lies between Cuba and Mexico), there are several possible courses. One recommended course is to pass between Roncador Bank and Serrana Bank to the East and Isla San Andres, Isla de Providencia and Quita Sueno Bank to the West. This was the general course chosen by the Master and Navigator of the IRISH SPRUCE. The peril involved in this route is that the passage between Quita Sueno bank and Serrana Bank is only 45 miles wide, and the lighthouses thereon have a maximum visibility of eleven or twelve miles. The earlier reached light on Roncador Bank is also weak and low-lying, prividing a poor radar target.[9] In addition, the Quita Sueno light is on its northerly approach and the Bank stretches for some 25 to 30 miles to the south, so that a vessel can easily strand on its south reaches before picking up the light.

The passage resembled a capital "A", with the top being a point between Jamaica and Honduras that the vessel was proceeding toward, to set off through the Yucatan Pass, and the bar across the A being the 45 mile passage, and the bottom corners being Providence Island and Roncador Bank. A 45 mile passage will ordinarily leave a

sufficient margin for navigational error and unexpected currents, providing that the vessel has an accurate point of departure within 100 or 150 miles and the maximum width of the passage is utilized. Unfortunately, however, neither of these situations existed.

The recommended course pursuant to the American Sailing Directions (which was not consulted for reasons which will be subsequently explained), is a more westerly route along the Isla San Andres (St. Andrews Island) and west of Providence Island, keeping Quita Sueno Bank well to the east. Although this route is a little longer, both of the islands have sufficient altitude to provide excellent radar targets as well as better lights and navigational aids. A third possible route proceeds slightly east of north from the Canal, keeping all reefs well to the west. This route is not recommended in any sailing directions, apparently because it is longer and there are no navigational aids along it.

Leaving the Canal on the projected course recommended by the British Admiralty Pilot, the vessel intended to steer a course almost due north. (Even that course would not have given as wide a leeway as a course of 350° True ("T.") which would split the broad part of the channel between the Quita Sueno and Serrana Banks.) Unfortunately, shortly after leaving the Canal in the early morning hours on January 26th, the vessel encountered rough seas and heavy swells and changed its course to the east to ease the rolling.[10] As the weather eased during the afternoon, further

course changes were made. A result of these changes was to cause the IRISH SPRUCE's projected angle of passage between the two banks to necessarily be more diagonal, so that the vessel would pass within eight miles of the light on Roncador Bank and within seven miles of the light on Quita Sueno.

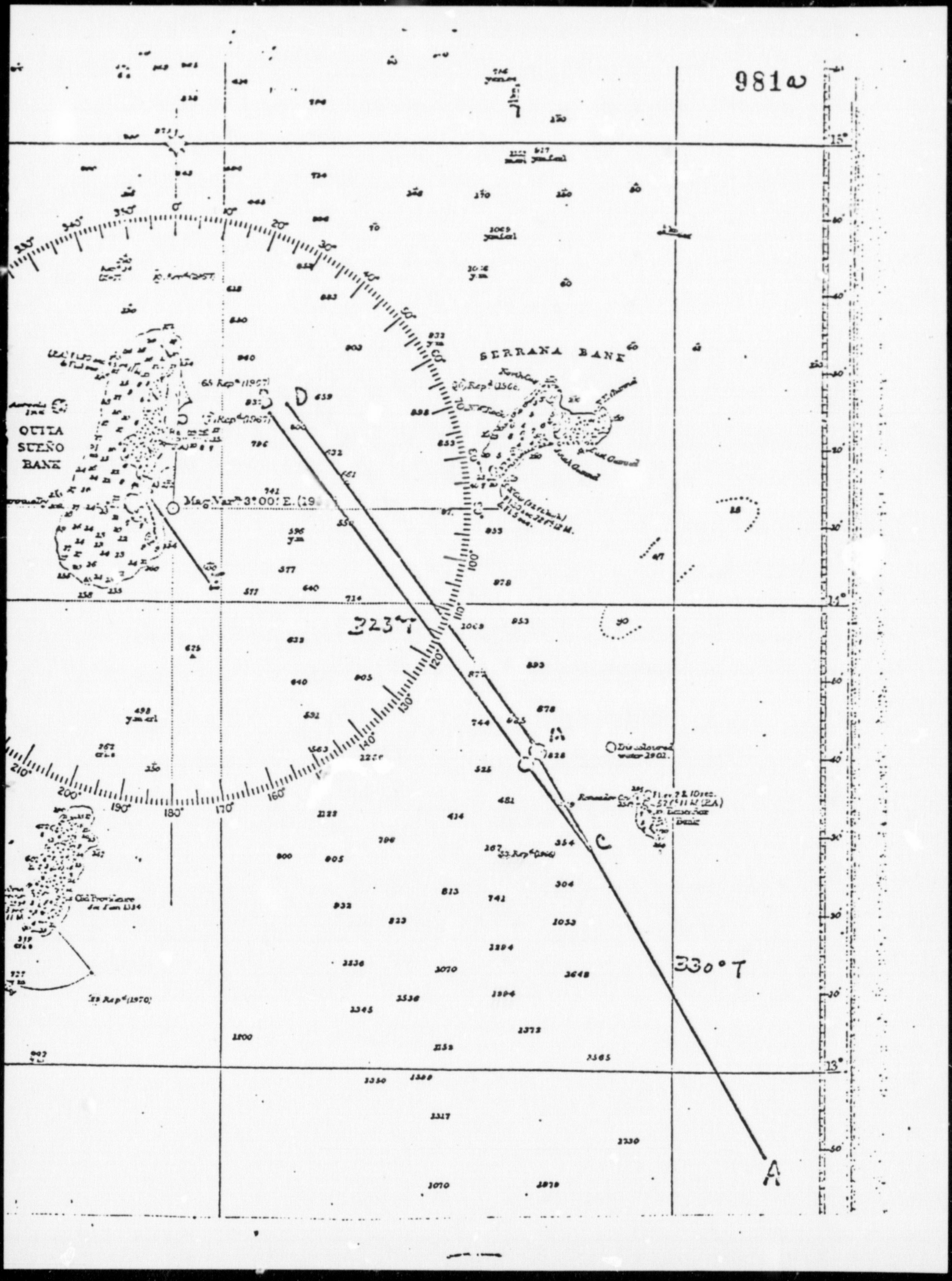
An even more unfortunate development occurred with respect to the obtaining of celestial navigational fixes. No position had been obtained at dawn. A noon position had been obtained by taking a sun line and advancing the morning position line. While the Navigator (Second Officer Healy) felt confident of the accuracy of this position, it was based on a form of running fix (which depends in part upon the accuracy of the dead reckoning since the time from which the morning line was advanced) and was taken in fairly heavy seas, which also reduced its reliability. Moreover, as the First Officer was taking his sights on the evening stars (the most accurate navigational aid), rain squalls obscured his horizon. Questioning the accuracy of the observations already made of three of seven selected stars, the First Officer did not even bother to plot the starlines. The vessel then set its course at a heading of 330° T., hoping to pick up the light on Roncador Bank at 2300 hours.[11]

The lonely rendezvous was never made. The light was not seen nor were any radar targets observed. The vessel plowed on the same course at full sea speed for an additional hour. At midnight the Captain had to make a decision. He could attribute the

980ω

failure to pick up the Roncador Light to its weakness and to the fact that heavy showers in the area might have obscured the light from radar had they been only a few miles off course.[12] But he also had to contend with the fact that there had been no navigational fixes for twelve hours, and that only a noon position; he was attempting to pass between treacherous banks at a poor angle; he did not believe that there were any radio beacons in the area worth using (a key point to be discussed later); there were neither navigational aids nor radar targets ahead for the next fifty or sixty miles (until Quita Sueno Light); the depth sounder (fathometer) was useless since the vessel was in deep water and the banks shoaled so rapidly as to provide little warning of their presence; the vessel's electronic position-finding equipment, the Decca navigator, was useless in those seas since there were no stations for thousands of miles; and the vessel was not equipped with loran[13] (another point to be considered later). Nevertheless the Master, (Captain Kerr), who was on the bridge, decided to alter course further to the West, to 323° T. hoping to ultimately pick up Quita Sueno Light. Full speed was maintained and the vessel was kept on automatic pilot.

The Navigator, Second Officer Healy, came on watch at midnight and was advised by the Captain of the decision made. The Captain remained on the bridge during the rest of the night. The only other person on watch was a seaman look-out. By this time


981ω
SERRANA BANK
OUTA SUEÑO BANK
Mag. Var. 3° 00' E. (19
323°T
330°T
A
C
D

the weather had improved, the seas abated, and the moon was shining much of the time. At 0230 hours, the radar picked up a target slightly off the starboard bow and at a range of 15.9 miles. The continued plotting of a fix on this target over the next half hour suggested that it was stationary. Although they had come now within sufficient range to see the lights, if it were another vessel, nothing was observed. The Master knew that there were no charted wrecks or reefs in the position of the target. Consequently, he assumed that the mysterious radar target was a seagoing fishing boat lying dead in the water without lights. He continued at full speed while continuing to plot its relative bearings.

At 0329 hours (when the unlighted object was only a few miles away) the Captain observed that the fathometer had suddenly recorded a sharply rising bottom, and that they had already passed over a reef only seven feet below the keel. At the same time, the look-out and navigator saw surf breaking ahead. The engines were reversed, but in a matter of seconds the IRISH SPRUCE had become impaled on the shoals of Ouita Sueno Bank. The dawn's light revealed that the radar target had been a wreck which they believed to be some twenty-five miles to the west. On the annexed chart the line from A to B represents the projected course. The line from C to D represents the revised course, with "M" at the midnight dead reckoned position. The line from E to F represents the actual course of the

IRISH SPRUCE during its last hour, based on radar ranges, with "X" marking the point of stranding.[14]

Why the IRISH SPRUCE was so badly off course is a matter of speculation. While a failure of some of the navigation equipment such as the automatic pilot cannot be entirely discounted, all of it had been tested when passing through the Panama Canal and found to be in working order.[15] It is generally thought, and was the opinion of the Captain, that the vessel had been carried twenty-five miles to the west by a strong current. About the only thing the parties do agree upon is this point. It is the failure of the vessel to anticipate and to observe this set and drift that is the main issue of contention.

Errors in Navigation

It is quite apparent that the immediate cause of the stranding was imprudent navigation. The original route selected, of those available, seems to be the most dangerous. When the ship changed course because of the high seas, she went well to the east of the originally projected course, and when the First Officer was unable to get a position from the evening stars, he ran a serious risk in plotting a diagonal course through the passage. The crucial errors did not occur, however, until midnight when the ship had failed to pick up the light on Roncador.

The dead-reckoned position put the vessel within nine

miles of the light. Although the Captain dismissed the failure to pick up the light either visually or on radar because of the rain squalls in the area, this merely indicates the imprudence in plotting a new course further westward. Captain Kerr acknowledged in his deposition that "... the navigational aids in this part of the world are very poor ... it is not a very good part of the world for navigation". (Exh. 60, p. 5). He admitted that from 2300 hours on "I was not sure where I was so I decided to run on for awhile to get a few more miles to be on the safe side". When asked what he meant by being "on the safe side", he replied "to avoid any reefs". (Exh. 60, p. 7).

The Captain had to know at 2400 (midnight) that he was at least somewhat off his course. He had not had any celestial navigation fixes for 12 hours (and that only a noon position) and he had been essentially dead reckoning for almost 24 hours. Since he was off his course, he could reasonably assume that he was neither north nor east of it, since in either of those instances he would have picked up (or run aground on) Roncador Bank. Consequently, he had to be either south or west of his dead-reckoned position. He attempted to cover the possibility of being south by continuing on course for an extra hour from 2300 to 2400, but this was unavailing. It should have seemed almost certain, therefore, that he was to the west of his intended course. Regardless of

whether he was west or south, if he was as much as ten miles off course (which should not have been surprising in view of the currents in those waters and the length of times since a reliable position had been obtained) the course change to 323° T. was certain to take the vessel over the Quita Sueno Bank. In light of what developed, it would appear that if he had simply continued on the original course of 330° T., that slight difference would have been sufficient to have sighted the Quita Sueno light on the northern part of the bank before stranding.

All of the expert testimony agreed that it was imprudent navigation to alter course at midnight to 323°. Indeed, even the vessel's navigator, Second Officer Healy, acknowledged that while he thought the navigation to be prudent at the time, having subsequently heard the expert opinions and having studied the situation (but without taking into account the hindsight advantage of knowing what actually occurred), he can now see that it was not prudent for the vessel to have continued on as it did.

There is some doubt in the expert's opinions as to what would have been prudent navigation at that time. One opinion is that the vessel should simply have hove to, put out a sea anchor and awaited the dawn. Another option suggested was that it should have sailed westward in the hope of getting radar ranges off Providence Island. At the very least, a more northerly course should

have been adopted. While Serrana Bank lay to the north of the assumed position, its light is at the southern part of the bank (as contrasted to Quita Sueno where the light is at the extreme northern end). Moreover, the light on Serrana Bank is higher and has a greater radar range. (According to the current American Sailing Directions, it has a radar reflector. Exh. G, Chapter #12, p. 147.) Consequently, had a more northerly heading been maintained it would have accounted for most contingencies, almost certainly preventing the stranding of the vessel.

Finally, in light of the vessel's situation, the assumption during the last hour of cruising that the target picked up was merely an unlighted fishing vessel was extremely imprudent. Some thought should have been given to the possibility that it was a radar-conspicuous wreck and that the vessel was badly off course. This apparently did not even cross the mind of the Captain. If the earlier errors cannot be classified as imprudent navigation, certainly those of this last hour clearly qualify as such. The owners have proved that the immediate cause of the loss of the IRISH SPRUCE was the navigational errors of her officers, thereby entitling them to exoneration from liability, Murray v. New York Central RR Co., 287 F.2d 152 (2d Cir. 1961), cert. den., 366 U.S. 945 (1961), The Temple Bar, 45 F.Supp. 608 (D.Md. 1942), aff'd. 137 F.2d 293 (4th Cir. 1943), unless an unseaworthy condition contributed to the loss.

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Unseaworthiness

Cargo claims that the IRISH SPRUCE was unseaworthy in several respects. These defects largely arise from the fact that the IRISH SPRUCE was equipped with British electronic position finding equipment (a Decca Navigator), and with British Admiralty publications. The vessel was not equipped with an American loran electronic position finding device, nor with a complete set of American nautical publications and charts.

The explanation given for the outfitting of the vessel was that it was constructed in the British Isles and is overhauled there. However, during most of its years of service the IRISH SPRUCE was in American waters as, indeed, were most of the vessels of the Irish Shipping Limited.

A. Loran

The Decca Navigator was of no value whatever in United States and Carribean waters since there were no transmitting stations for thousand of miles and its range is relatively short. While the loran coverage in the area of the stranding is marginal, the evidence established that nighttime fixes could be obtained with reasonably good intersecting angles.

There has been a judicial reluctance to find that the failure to employ the major electronic navigational aids (even radar, which is almost universally used by seagoing and coastwise

vessels of all sizes) constitutes an unseaworthy condition, although the Courts have been willing to consider the inoperability of radar aboard as unseaworthiness. M.S. Nicolaos S. Embiricos, (unreported, Judge Frankel, S.D.N.Y., November 16, 1973). Fourteen years ago Judge Medina, in Afran Transport Co. v. The Bergechief, 274 F.2d 469 (2d Cir. 1960), indicated that sooner or later radar would be required. A similar statement was made in President of India v. West Coast Steamship Company, 213 F.Supp. 352 (D.C. Or. 1962), affirmed 327 F.2d 638 (9th Cir. 1964), cert. den. 377 U.S. 294 (1964), with respect to both radar and loran.

Owners contend that, while there is considerable argument for requiring radar on seagoing vessels (see e.g. "Radar and the New Collision Regulations", Tulane Law Review, Vol. XXXVII, # 4, page 621 (June 1963)), radar and loran are not comparable since radar can be used anywhere in the world, while loran is confined to those areas having loran coverage. There is, in fact, loran coverage throughout most of the northern hemisphere and considerable parts of the Pacific. Bowditch, American Practical Navigator, p. 332, British Pilot (Exhibit D. p. 13). Radar is, of course, extremely valuable in coastwise cruising but on the open seas has little navigational value except to avoid collisions with other ships.

It appears proper in admiralty cases for the finder

of fact to use his own knowledge of navigation and seamanship acquired by personal observation and experience.[16] The Eleanore, 248 F. 472, 473 (6th Cir. 1917). From this I can say, without hesitation, that the equipping of the vessel with a Decca Navigator useful only in the area of the British Isles rather than a loran receiver, which would have been of value to the vessel during all of its voyages since its last drydocking, denied the vessel the most valuable deep sea electronic navigational aid in wide usage at the time of stranding.[17]

Despite my strong personal belief concerning the value of loran, and the error of the shipowners in failing to equip the vess l with it, this would appear to be an inappropriate case in which to venture into perilous legal seas with inadequate appellate guidance. Moreover, the absence of loran was not set forth as an issue in the pre-trial order in this case. There was no full evidentiary hearing. No expert testimony was presented concerning the essential nature of such equipment. Consequently, the absence of loran (and the presence of the totally useless Decca Navigator) will not be considered an element of unseaworthiness. However, this situation does stress the need for making maximum use of the remaining electronic navigational aids aboard the vessel.

B. British Navigational Publications

While the British Admiralty Navigational Publications

are considered, overall, among the world's best (if not the best), it was established that the publications of the nation whose waters or trade routes are involved (these routes were between the U.S. administered Canal Zone and U.S. Gulf ports) are likely to be the most current and accurate. The courts, however, have not required vessel owners to supply the navigational publications of all countries, or even of those closest to the area being transitted. The Temple Bar, supra; M.S. Nicolaos S. Embiricos, supra. But the failure to supply complete American nautical publications, despite the fact that this vessel, like most of the Irish Shipping Ltd. vessels, was operating mainly in American waters, certainly emphasizes the need for keeping the British Admiralty Publications completely up-to-date.

The responsibility of the owner is to supply the necessary navigational publications so that the ship may be properly navigated:

> "Our view of the law, now that the point has been definitely raised, is that charts, light lists, and similar navigational data are essential equipment for the safe navigation of a ship, that she is unseaworthy without them, and it is the duty of her owner to supply them. Such documents of course become sources of information for the navigator, and the task of securing them is often delegated to officers of the ship. Failure to supply adequate information or navigation without it may thus constitute negligent navigation or management for which they are chargeable; but it does not follow that the owner is thereby relieved by the Harter Act from liability from ensuing disaster, because the same circumstances may also amount to failure on his part to use due

> diligence to make his vessel seaworthy. The duty of an owner in this respect is nondelegable; and the navigation of a ship defectively equipped by a crew aware of her condition does not relieve the owner of his responsibility or transform unseaworthiness into bad seamanship." The Maria, 91 F.2d 819, 824 (4th Cir. 1937).

C. The Sailing Directions

The British Admiralty Sailing Directions, with which the IRISH SPRUCE was equipped, was the West Indies Pilot, 11th Edition, 1956, including a supplement. This had been superceded by the first edition of "The East Coast of Central America and Gulf of Mexico Pilot" issued in 1970. This newer volume contained revised current information and contained the following "current caution" with respect to the Quita Sueno Bank:

> "caution should be exercised when passing eastward of Quita Sueno bank as the current here sets strongly to the westward and on the bank". (Exh. D, p. 74).

This caution had apparently been derived from earlier American sailing directions. The 1970 edition of the pilot had been ordered by the vessel months earlier but had not been received. (This aspect is discussed later in the section entitled "Due Diligence".)

Captain Kerr testified on deposition (he did not testify at trial) that he was surprised at the extent of the westerly set of the current, and that he "would have allowed a certain number of degrees to counteract the current" had he anticipated it. (Exh. 60, p. 40).

Although the new pilot had been ordered, the failure to have it aboard the vessel in those waters, and without the U.S. publications, constituted an "unseaworthy condition" in the legal sense. The W.W. Bruce, 94 F.2d 834, 838 (2d Cir. 1938); The Maria, supra. However, this unseaworthy condition does not appear to have been a material cause of the stranding. The radar ranges taken during the last hour of the vessel's voyage does not indicate any strong set westward as the vessel was approaching Quita Sueno Bank. It appears much more likely that the vessel had been encountering a westward set for twelve or more hours prior to running aground. Indeed, considering the seas and wind conditions earlier the preceeding day, there is a likelihood that the vessel had been set to the west of its noon position. This, not an unusual current found near the Quita Sueno Bank, seems responsible. The failure to anticipate the strong local current was, at most, only a small contributing factor to the loss.

D. The List of Radio Beacons

The matter of the List of Radio Signals aboard provides a much more difficult question. The IRISH SPRUCE had aboard the Admiralty List of Radio Signals, Vol. 2, published in 1969. This had been superceded by the 1971 list. The 1969 list did not reveal that there was an aerial radio beacon on Isla San Andres (St. Andrews Island) that would be a valuable marine aid. The new volume, which was also on order, gave all of the details concerning the radio

beacon on Isla San Andres. This information was also apparently acquired from the American list of signals. Cargo strongly argues that the failure to have the current list constituted an unseaworthy condition.

The owner has a number of responses to this. Initially, it asserts that the superceded publications on board were sufficient to alert the Captain and Navigator to the existence of the radio beacon and to encourage them to use it. In a chart in the back of the 1969 list (Exh. 10) there is an indication of an aerial radio beacon on San Andres. But the beason was not listed in the alphabetical list of call signals beginning on page 17, nor in the geographical index beginning on page 10, nor in the alphabetical list of Morse identification signals beginning on page 77, nor the list of radio beacons beginning on page 86. Moreover, neither the power of the beacon nor the fact that it was in continuous transmission are shown on the chart and the volume contained a warning that unlisted aero beacons were not considered reliable for marine use.[18]

On the other hand, the 1971 edition lists the radio beacon at San Andres in detail (Exh. E, p. 183), giving its Morse identification signals, listing it in the alphabetical index of stations and, most important, setting forth its power (one kilowatt) and the fact that it is in continuous transmission. Moreover, the new volume indicates that a beacon of one kilowatt may be expected to be usable, under good conditions, up to a range of 240 nautical miles.

Under these circumstances, I find that the list aboard was inadequate to alert a reasonably prudent navigator to the possible use of this navigational aid. The W.W. Bruce, supra.

A second argument of the owners is that since Captain Kerr indicated some knowledge of the existence of the station he would not have been inclined to use the new list even had it been on board. The fallacy in this argument is twofold. In the first place, Captain Kerr's knowledge of the beacon was extremely limited and, in great part, incorrect. In his deposition he acknowledge that he did not know the range or power of the beacon, but that he had been told that it was quite weak. Actually, it was not weak. Had Captain Kerr had accurate knowledge of the beacon's capability, it is quite possible he would have used it. In any event, his generalized indication that he would not have used the beacon (testimony intended to relieve his employers from liability) is not binding nor even particularly persuasive. Had Captain Kerr testified at trial this issue could have been better explored. Moreover, Kerr was not the only officer aboard. The Chief Officer had testified that if he had known about the beacon, and could have determined its capacities from the index or geographical index, he would have used it. While the Captain had ultimate responsibilty for the navigation of the vessel, initial responsibility rested upon the Navigator, Second Officer Healy. His testimony was that he was not aware of the radio beacon on the Isla San Andres, and that he would have used it had he been aware of it. While Mr. Healy is relatively young, he appeared

to be an unusually conscientious navigator. Had he had the revised list on board, I find that he would have examined it, determined the availability of the radio beacon, and used it.

The owners' final position on this issue is that, even had the ship attempted to use the San Andres beacon, it would have been of no value for navigational purposes. This position has a number of components. The owners first argue that there was no proof that the beacon was in operation on the particular evening in question. The evidence showed that it had been in continuous transmission prior to that time, and that it was in continuous transmission thereafter. There was no proof that any warnings to navigators were issued showing that the beacon had been out of operation at any time. Under these circumstances, there is sufficient evidence to find that the beacon was in operation on the night in question.

Next the owners argue that they were out of the effective range of the beacon during the critical period. During the eight hours prior to the stranding, the vessel's assumed position was slightly more than a hundred miles away from the Isla San Andres radio beacon, running almost perpendicular to it. At the time of stranding, she was actually only 105 miles from the beacon, indicating that at the time of the crucial midnight decision she was less than 90 miles away.

The owners argue that, because of night effect and local weather conditions, the range of the beacon would not have

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been sufficient. Night effect, however, is primarily a phenomenon of the sunrise and sunset hours when there is ionospheric disturbance. During the nighttime hours involved, little of this effect would have been experienced. Even under bad weather conditions, the evidence established that the beacon was usable for 150 miles.

Cargo, as well as owners, offered considerable evidence concerning the use of the beacon by other vessels navigating in the area.[19] Owners object to the evidence presented by cargo concerning receipt of the signals by other vessels on grounds that the conditions were dissimilar. It would, of course, be impossible to reproduce the exact situation which existed on the night of the stranding. With one exception (a vessel which sailed to the west of Quita Sueno), all the other evidence was sufficiently similar to indicate the general capabilities of this particular radio beacon.

Owners' experts had much less success in obtaining reliable bearings from the beacon. However, the evidence established reasons for this, and, obviously, it is much easier to accomplish something if you want to do it.

Finally, the owners argue that, even if the signal had been received and had given a relatively accurate bearing, it would not have been of any great aid in navigation. It is true that a single line of bearing is not of the same value as two or more intersecting lines giving a "fix". However, it is possible to make a "running fix"[20] from a single bearing. While such a

running fix would not have been tremendously accurate, it would have given a better approximate position than a dead reckoning carried for 12 or more hours.

More important, the beacon on San Andres would have provided an excellent "danger bearing".[21] Providing that a bearing of 205° T. or greater had always been maintained, there would have been no possibility of the vessel running aground on Quita Sueno Bank. The owners argue that Providence Island, which is quite high, might have interfered with the reception. Providence Island would not have cast a shadow along the bearing line unless the bearings grew less than 205°. Consequently, a danger bearing of 205° T. or greater could have been used, and if maintained would have kept the vessel out of danger.

Considering the unavailability of celestial bearings, the fact that the vessel was equipped with the wrong type of electronic position finding device, and was operating in open waters too far from land to make any use of the radar and too deep for the depth sounder to be of any value, the importance of the use of the radio direction finder in this instance is apparent. The courts have recognized the general importance of the radio direction finder as a navigational aid. Waterman Steamship Corp. v. Gay Cottons (The Chickasaw), 414 F.2d 724 (9th Cir. 1969). Radio direction finders are required on all ships of 1600 tons gross tonnage and up when engaged on international voyages. (1960 Safety Of Life At Sea

Convention, to which both Ireland and the United States are signatories, Regulation 12.) Consequently, I find that the failure to have the current list of radio beacons aboard the vessel, where the superceded list did not reveal the usefulness of the beacon, was, under the circumstances of this case, an unseaworthy condition.[22]

Causation

The burden of proof rested initially on the owner to establish that the proximate cause of the loss was an error in the navigation or management of the ship. Owners have met this burden. Having established that the proximate cause of the loss was an excepted peril, the burden shifted to the cargo claimants to establish that the unseaworthiness caused the injury. Director General of India Supply Mission v. SS Maru, 459 F.2d 1370 (2d Cir. 1972); Firestone Synthetic Fibers Co. v. M/S Black Heron, 324 F.2d 835 (2d Cir. 1963). Moreover, the unseaworthiness must be shown to be "an effective and proximate cause of the damage". Union Carbide and Carbon Corp. v. The Walter Raleigh, 109 F.Supp. 781, 793 (S.D.N.Y. 1951), aff'd. sub non, Union Carbide and Carbon Corp. v. United States, 200 F.2d 908 (2d Cir. 1953).

Was the absence of the new radio beacon list an effective and proximate cause of the grounding? This is an elusive issue. We are not dealing with coordinate or sequential causes as in Union Carbide and Carbon Corp. v. The Walter Releigh, supra. Obviously, inadequate navigational aids increase the risk of careless navigation,

which was the immediate cause of the loss. But it is another thing to conclude that the careless navigation could have been prevented had the unseaworthy condition not existed. Justice Cardozo long ago warned of the dangers inherent in such a consideration:

> "There would be no end to complications and embarrassments if the Courts were to embark upon an inquiry as to the tendency of an unseaworthy defect to aggravate the risk of careless navigation". May v. Hamburg-Amerikanische Packetfahrt Aktiengesellschaft, 290 U.S. 333, 54 S.Ct. 162, 78 L.Ed. 348.

Yet that is exactly what we must do.

The reported cases have attempted to avoid such considerations. In Waterman Steamship Corp. v. Gay Cotton, supra, the Court viewed an unseaworthy condition, resulting from the inaccuracy in the deviation card for the radio direction finder, to have been an instance of combined causation, along with the negligence of the crew, thereby making the ship liable.

In the West Arrow, 80 F.2d 853, 856 (2d Cir. 1936) the Court dealt with a defect in the ship's steering gear and the failure of the owners to respond to publicized information concerning the possibility of such malfunctions as separate proximate causes. The Court held then:

> "Neglecting precautions, which might have been taken if the instructions of the manufacturer had been carried out, makes the ship responsible for the resulting damage without clearer proof than was presented here that the accident was caused by a

> failure of performance which sprung from a latent defect. Cf. Atlantic Transport Co. v. Rosenberg Bros. & Co., 34 F.(2d) 843 (C.C.A.9); The Vestris, 60 F.(2d) 273 (D.C.S.D.N.Y.); The Ceylon Maru, 266 F. 396 (D.C.Md.). Moreover, negligence in navigation was one of the proximate causes of the stranding as well as failure of the telemotor system. In these circumstances, it is now authoritatively established that there need be no causal connection between the unseaworthiness and the loss. May v. Hamburg-Amerikanisch Packetfahrt Aktiengesellschaft, 290 U.S. 333, 54 S.Ct. 162, 78 L.Ed. 348."

The passage of the Carriage of Goods By Sea Act in 1936 makes the necessity of delineating causation attributable to unseaworthiness unavoidable.

Decisions often avoid such a difficult interplay by simply finding that the unseaworthy condition was not the cause of the defective navigation. In the Director General of India Supply Mission v. S/S Maru, supra, the Court found that, although there were outdated charts which constituted an unseaworthy condition, the Master had not relied thereon, and, consequently, the stranding was not caused by the unseaworthy condttion. In United States v. Soriano, 366 F.2d 699 (9th Cir. 1966), it was found that the inoperativeness of the fathometer had nothing to do with the pilot's negligent navigation of the vessel, which alone was the proximate cause of the stranding.

Owners, naturally, rely heavily on Judge Frankel's decision in M.S. Nicolaos S. Embiricos, supra. That case rests

on the factual finding that the error was not in the failure to supply proper navigational information but in the Master's improper use of information available aboard the vessel. Here, however, we have an omission which affected the quality of the navigation. Analytically, there is no difficulty in labelling an omision as a "cause". The point is made by Hart and Honore in Causation in the Law, p. 179 (1962):

> "There are a number of situations in the law of negligence ... where a defendant is liable for providing or not removing the opportunity for another to do harm or for a natural event to cause it. The 'causal connection' between a defendant's act and the harm may be succinctly described by saying that he had 'occasioned' it.
>
> The use of this notion in the law is an extension of the general idea, common in non-legal thought, that the neglect of a precaution ordinarily taken against harm is the cause of that harm when it comes about."

The question is whether compliance with the duty to maintain a seaworthy ship might have prevented the intervening cause, viz., the error in navigation. This is, of course, a question of fact. We must determine whether the direct or intervening cause "is a significant part of the risk involved in the defendant's conduct, or is so reasonably connected with it that responsibility should not be terminated", or, more simply, whether the intervening cause is foreseeable. Prosser, Torts, (4th Ed. 1971) at 272.

Though the omission may not set the stage for an affirmative intervening cause, it may be no less a "proximate cause" for permitting

an intervening event to cause injuries which might have been avoided. For example, in Zinnel v. U.S. Shipping Board Emergency Fleet Corp., 10 F.2d 47 (2d Cir. 1925), defendant failed to provide a guard line along the side of the deck. During a storm a crew member was washed off the deck. The issue was whether a line would have prevented the deceased from falling. Judge Learned Hand's opinion for the court answered:

> "About that we agree no certain conclusion was possible. ... (W)e are (not) justified, where certainty is impossible, in insisting upon it. We cannot say that there was no likelihood that a rope three feet above the deck ... would not have saved the seaman." Id. at 49.

The clear implication of Judge Hand's opinion is that claimants are entitled to prove that the omission caused the injury by permitting an intervening cause which might have been prevented.

This opinion was cited in a later case involving somewhat analogous facts. In Kirincick v. Standard Dredging Co., 112 F.2d 163 (3rd Cir. 1940), the court held that failure to throw a life preserver to a seaman who had fallen off a barge was actionable negligence. Compliance with the duty would not have affected the intervening cause (falling overboard) but would have prevented the ultimate injury.

Having found that the ship's officers would have made use of the beacon had they known of its availability, and that this would have provided vital navigational information that would have prevented the stranding, the unseaworthy condition was an effective

cause of the loss. It was a "proximate cause", under the general principles of torts described above. Although the absence of the new light list may seem a small defect, "the event turned on [it]... as the massive door of a vault turns on a small jewel bearing".[23]

Due Diligence

The finding that an unseaworthy condition existed and contributed to the loss leaves one remaining issue. It must be found that the failure to exercise due diligence by the owner caused the unseaworthy condition. The burden is on the carrier to prove that it used due diligence to make the vessel seaworthy. This burden is clearcut and never shifts from the carrier. 46 U.S.C. 1304 (1).[24] Any question as to the exercise of due diligence is strictly construed against the carrier. Compagnie Maritime Francaise v. Meyer, 248 F. 881 (9th Cir. 1918). In Metropolitan Coal Co. v. Howard, 155 F.2d 780, 783 (2d Cir. 1946), Judge Learned Hand said:

> "the warranty of seaworthiness is a favorite of the admiralty and exceptions to it or limitations upon it, are narrowly scrutinized.".

The evidence was clear that there was no regular practice of providing U.S. charts, pilots, or radio beacon lists to the vessel. The current and new British Admiralty navigational publications were only available through a bureaucratic system by which the owners first mailed to the vessel a notice to mariners indicating the publication of new periodicals. The vessel then filled out a form indicating its

desire to have the publication which was then mailed back to Ireland. The owners would then obtain the required publication and mail it to the vessel. This system takes several months for vessels in the Western Hemisphere. It was followed in this instance and during that several-month period, the vessel ran aground for want of the necessary publications. The owners knew that the vessel was awaiting the publications during this period.

Owners argue that there was nothing to stop the Master of the vessel or the Navigator from independently purchasing the necessary nautical publications. However, the publications were, presumably, first available only in the British Isles. Moreover, the directions given to the vessel were very clear that this was not the usual or proper method of proceeding, and such independent purchasing was clearly discouraged.[25]

While there are many publications whose necessity is a matter of discretion, the Pilot (whose absence might have been a contributing although not proximate cause) and the List of Radio Signals were clearly necessary to the vessel, and no order from the navigator to the home office should have been necessary. The 1971 List of Radio Signals could have been obtained by owners two and one-half months before the stranding. Indeed, the notice that the publications were available (rather than the publications themselves) was received by the ship a month and a half before the stranding. Publications, when ultimately sent, were not even air mailed. The publications should have been obtained by the owners as soon as they were available and

immediately air mailed to the vessel. The failure to do so constituted a lack of "due diligence".

Conclusion

Owners and charterers are liable to cargo and an interlocuto judgment should be entered reserving damages for later determination. Charterer is entitled to be indemnified by owners for this liability under the terms of the charter, and to judgment against owners for all losses and damages resulting from the loss of the vessel.

Respectfully,

Gerard L. Goettel

Gerard L. Goettel
United States Magistrate

DATED: New York, N.Y.
October 15, 1974

FOOTNOTES:

1. These cases were referred by Order of Judge Frankel dated January 25, 1974, for hearing and report upon the consent of the parties.

2. The IRISH SPRUCE was a dry cargo vessel registered under the laws of the Republic of Ireland. She was built in England in 1957 and held in the highest class of hull and machinery of Lloyd's Registry of Shipping. Her length overall was 449 feet. Her extreme breadth was 62 feet 3 inches. Her registered gross tonnage was 7,875 and her net tonnage 4,555. Her maximum sea speed was 16 knots.

3. Some of the cargo was salvaged and eventually taken to New Orleans. The vessel was sold "as is" and "where is" for $15,000.

4. The case was tried on liability only with the assessment of damages, said to be in excess of $2,000,000, reserved for subsequent adjudication if necessary.

5. Irish Shipping Limited is a corporation organized and existing under the laws of the Republic of Ireland.

6. Claimant Sprague & Rhodes Commodity Corp., et al, in 72 Civ. 3199 and plaintiff American Smelting and Refining Company in 72 Civ. 656 are corporations and business organizations which were the owners of the cargoes laden on board the S.S. IRISH SPRUCE when that vessel stranded, or are underwriters of such cargoes which, by reason of their payments, have become subrogated to the rights of such owners.

7. Compania Peruana de Vapores is a business entity organized and existing under and by virtue of the laws of the Republic of Peru, and the cargo laden on board the IRISH SPRUCE was carried pursuant to the bills of lading provided by Compania Peruana de Vapores and signed by the Master.

8. The uninhabited reefs mentioned herein belong to the Republic of Columbia and the navigational aids thereon are maintained by it.

9. Had the projected course been further to the west there would have been the possibility of obtaining radar ranges off Providence Island which has a maximum elevation of 1190 feet.

10. A possible reason for the course change in what were not really extreme conditions was that the vessel had some precious super-cargo: the wives of the Captain and the Chief Engineer. Perhaps out of gallantry, neither side made any reference to this.

11. Despite the fact that they were already far east of their projected course, apparently no consideration was given to the possibility of continuing on a northerly course steering well to the east of Roncador and Serrana Bank on open seas; this would not have required a course change to more dangerous waters until the daylight hours and, from the vessels then assumed position, would have been only slightly longer.

12. The light on Roncador is a pyramidal framework, a type difficult to contact by radar because it is not solid and because the angles of its sides tend to diffuse the radar impulse skyward rather than back to the radar. It was not equipped with a radar reflector.

13. The IRISH SPRUCE was equipped with various electronic and other navigational instruments including radar, radio direction-finder, fathometer, gyro- and magnetic compasses, automatic pilot, and course recorder. Most of the electronic equipment was rented from Marconi International and was serviced by their employees when the vessel was in an Irish or English port. Marconi technicians could also be called upon when needed in other parts of the world.

14. The chart contains both an X and a circled X. The circled X marks the charted position based on this British chart's position of the radar conspicuous wreck: Lat. 14°16' N., Long. 81°10' W. (The wreck appears on this chart at the top right hand corner of the uncircled X.) The uncircled X represents the position of the vessel as revealed by several subsequent sights taken later by the Navigator indicating the radar-conspicuous wreck to be in a different position. The U.S. charts show the wreck as being at 14°16-1/2'N. and 81°8' W. Although the U.S. chart appears more accurate in this respect, it was not a significant factor in the stranding.

15. The ship's gryo had an error of 1-1/2° which was said to vary. (Exh. 60, page 12). Only a 1° correction was used. While this could produce some deviance over a prolonged period of dead reckoning, it was not sufficient to explain such a drastic difference.

16. The undersigned was for a couple of years a navigator in the U.S. Coast Guard, for a short period the Commanding Officer of two loran stations, and also spent two summers as a merchant seaman.

17. Expert testimony established that loran is being replaced by a new system called "Omega" which will provide world-wide coverage when fully operational.

18. The evidence established that while not all radio beacons installed primarily for aircraft are suitable for marine use, those on an unobstructed coast or small island (such as San Andres) are not only suitable but often superior for marine use. (They are usually newer and stronger than marine beacons.)

19. During a time when there is much criticism concerning the abilities of the trial bar, it is worth noting the exceptional efforts which counsel for both major parties took in presenting their cases. No expense appears to have been spared in obtaining all relevant evidence and presenting the best expert testimony. Moreover, the case was tried expeditiously, courteously, and with great competence. The briefing of all the controverted points was extensive. Whatever may be the shortcomings of our trial bar in general, New York's Admiralty Bar seems unaffected by it.

20. A "running fix" is a position determined by crossing lines of position with an appreciable time difference between them and advanced or retired to a common time". Bowditch, American Practical Navigator, p. 944.

21. A danger bearing is "the maximum or minimum bearing of a point for safe passage past an off-lying danger". Bowditch, American Practical Navigator, p. 920.

22. Cargo claims also that the vessel was unseaworthy by virtue of the fact that the lookout was stationed on the bridge and not on the bow. Under the conditions prevailing this did not create an unseaworthy condition and, moreover, did not cause the stranding.

23. Wouk, The Caine Mutiny, Preface.

24. Section 1304(1) of the Act provides that:

> "Whenever loss or damage has resulted from unseaworthiness, the burden of proving the exercise of due diligence shall be on the carrier or other persons claiming exemption under this section".

25. Exh. Z, concerning the normal procedure for ordering nautical charts, reads, in part, as follows:

> "On receipt of any orders for charts from our vessels the order is duly passed on to our contract supplier who processes this order and forwards charts, etc. to the address which will be most suitable for the vessel concerned.

> The only time that we deviate from this practice is when a vessel urgently requires a chart for an area to which she may be proceeding and which may not be on board at that time...".

While this refers (by its terms) only to charts, the ordering of publications, which are more expensive, was governed by the same bureaucratic approach.

RIDER

Line -	Line -	Correction
2	4	"from" changed to "of"
3	16	the spelling of "providing" corrected
10	3	"times" changed to "time"
10	16	"can" changed to "could"
12	13	"the" omitted
12	16	the spelling of "Caribbean" corrected
16	21	"pilot" capitalized
17	1	"pilot" capitalized
17	7	"does" changed to "do"
18	10	the spelling of "beacon" corrected
19	9	"acknowledge" changed to "acknowledged"
21	last	"from a single bearing." changed to "from successive bearings."
22	14	"bearings" changed to "observations"
23	2	"Regulation 12.)" changed to "Chap. 5, Reg. 12.)"
24	19	"In the West Arrow" changed to read "In The West Arrow"
25	25	the spelling of "condition" corrected
26	5	the spelling of "omission" corrected
26	14	"had" changed to "has"
26	25	"the" added between "that" and "responsibility"
27	7 &19	"Court" capitalized
28	3	"light list" changed to read "radio beacon list"

NOTICE OF MOTION TO CONFORM

Filed November 7, 1974—Sprague & Rhodes

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- -X

In the Matter of the Complaint :

of : 72 Civ.3199 (MEF)

IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability. :

- -X

AMERICAN SMELTING AND REFINING COMPANY, :

Plaintiff, :

-against- : 72 Civ. 656 (MEF)

S.S. IRISH SPRUCE, her engines, tackle, etc., :

-and against-

IRISH SHIPPING LTD., :

Defendants. :

- -X

S I R S :

PLEASE TAKE NOTICE that, pursuant to F.R.C.P. Rule 53 (e)(2), the undersigned shall move this Court on November 12, 1974, at 10:30 A.M., or as soon thereafter as counsel can be heard, in Room 2002, United States Courthouse, Foley Square, New York, New York, to adopt the Special Master's Report filed in this matter by Magistrate Gerard L. Goettel on October 30, 1974.

Dated, New York, New York
November 6th, 1974.

Yours, etc.,

/s/

BIGHAM ENGLAR JONES & HOUSTON
Attorneys for Cargo Claimants,
Sprague & Rhodes Commodity Corp.,
et al.

Office & P. O. Address
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1012 ω

TO: HEALY & BAILLIE
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29 Broadway
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HAIGHT, GARDNER, POOR & HAVENS
Attorneys for Compania Peruana de Vapores
One State Street Plaza
New York, New York 10004

OBJECTIONS TO SPECIAL MASTER'S REPORT

Irish Shipping Ltd.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- -x

In the Matter

of the

Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. IRISH SPRUCE, for exoneration from or limitation of liability.

72 Civ. 3199 MEF

- -x

OBJECTIONS TO REPORT OF SPECIAL MASTER

AMERICAN SMELTING AND REFINING COMPANY,

Plaintiff,

-against-

S.S. IRISH SPRUCE, her engines, tackle, etc.,

72 Civ. 656 MEF

-and against-

IRISH SHIPPING, LTD.,

Defendants.

- -x

S I R S :

PLEASE TAKE NOTICE that IRISH SHIPPING LTD., Plaintiff in the first above-entitled action and Defendant and Claimant of the S.S. "IRISH SPRUCE" in the second above-entitled action, hereby objects to the Report of United States Magistrate Gerard L. Goettel, Special Master, filed herein on the 30th day of October, 1974, in the following particulars:

1. The Report is clearly erroneous in proposing that the Court find that the "IRISH SPRUCE" was unseaworthy and that such unseaworthiness was a cause of the cargo loss which is the subject of these actions.

a. The proposed findings of unseaworthiness and causation are based on a misconception of the burden of proof

rules established by the Carriage of Goods by Sea Act ("COGSA"), 46 U.S.C. §§ 1300-1315, as distinguished from the rules applicable under the Harter Act, 46 U.S.C. §§ 190-195, and are directly contrary to the law in this Circuit as laid down by the United States Court of Appeals in two controlling decisions: Director General of India Supply Mission v. The Maru, 459 F.2d 1370 (2d Cir. 1972), and The Nicolaos S. Embiricos (not yet reported), Nos. 74-1218, 74-1265, 74-1266, 74-1354 and 74-1438, affirming this Court's decision on this Court's opinion (not yet reported), 69 Civ. 4644 and 70 Civ. 290.

The Report dismisses out of hand the Court of Appeals decision in The Maru by characterizing it as an example of decisions that "avoid such a difficult interplay [causative unseaworthiness] by simply finding that the unseaworthy condition was not the cause of the defective navigation" (Report, p. 25).

b. The proposed finding of unseaworthiness is based upon inferences which are squarely contrary to the physical evidence and the uncontroverted testimony of the witnesses.

2. The proposed finding of unseaworthiness is unsupported by any evidence in the record. Even if it be assumed, for present purposes, that the "caution" concerning the local current of Quita Sueno Bank was essential to the seaworthiness of the vessel, the Report is in error in ignoring the undisputed facts (1) that the "caution" was on board the vessel, and (2) that the officer of the watch at the time of the stranding was personally familiar with it. Similarly, the proposed finding that the absence of a revised List of Radio

Signals constituted unseaworthiness ignores the undisputed fact that the publications which were on board the vessel contained all of the information necessary to enable the navigators to utilize the station on San Andres if they chose to do so.

3. The Report improperly relies on the Special Master's personal experience as Commanding Officer, for short periods, of two Loran stations, a circumstance not disclosed to Counsel before or at the commencement of the hearings. Despite the disclaimer to the effect that such experience did not influence the Report, the statement (Report, p. 14) that "this situation [the absence of Loran] does stress the need for making maximum use of the remaining electronic navigational aids aboard the vessel" - a standard not required by law - quite clearly indicates that it did. In fact, the Report appears to be permeated by the notion unsupported by any evidence that a vessel not equipped with Loran cannot be seaworthy under any circumstances.

For the foregoing reasons, which are more fully set forth in the Memorandum of Law accompanying these Objections, IRISH SHIPPING LTD. respectfully prays:

1. That the Motion of American Smelting & Refining Company, dated November 6, 1974, for confirmation of the Report of the Special Master, be denied;

2. That IRISH SHIPPING LTD.'s Objections to the Report be sustained;

3. That judgment be entered, granting IRISH SHIPPING LTD. exoneration from liability and dismissing the complaint of American Smelting and Refining Company, with costs;

4. That the Court grant such other and further relief as may be just and proper.

Dated: New York, N.Y.

November 25, 1974

Yours, etc.,

HEALY & BAILLIE

By: _____

Allan A. Baillie
A Member of the Firm

Attorneys for Irish Shipping Ltd.
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943-3980

TO:

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DISTRICT COURT'S MEMORANDUM AND DECISION

(# 41989) Remanding Case to Magistrate

4105-9
R&A

10170

FILE COPY
KNIGHT, GOLDBERG, RAE & HYDE
ONE STATE STREET NEW YORK
3/5/75
R E
BY: D D2P

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

FILED
U.S. DISTRICT COURT
MAR 5 11 13 AM '75
S.D. OF N.Y.

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE" for exoneration from or limitation of liability.	:	72 Civ. 3199
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, -against- S.S. IRISH SPRUCE, her engines, tackle, etc., -and against- IRISH SHIPPING LTD., Defendants.	:	72 Civ. 656

#41987

MEMORANDUM -
Decision

FRANKEL, D.J.

The court has studied the record, the painstaking Report of Magistrate Goettel, and the opposed submissions of the parties as to whether the Report should be approved. With one exception, the Magistrate's findings and conclusions are confirmed.

The single exception, as will appear, requires a remand.

The record amply supports, certainly against any claim of "clear error," the Magistrate's findings that (1) the aerial radio beacon on San Andres Island was operating on the night of the stranding, (2) the Irish Spruce could have made contact with the beacon had the ship's officers purposefully tuned the radio direction finder, and (3) this would have made possible the obtaining of a "running fix" from the beacon which would have revealed that the ship was off course and avoided the stranding.

Similarly, the court sustains the finding that the absence of the 1971 Admiralty List of Radio Beacons aboard the Irish Spruce constituted an unseaworthy condition. While the existence of the San Andres beacon was noted in various books on the vessel, none of these provided the information contained in the 1971 List concerning the power of the beacon and its continuous operation. The Magistrate could find, as he did, that the power rating, far from being irrelevant, reveals the effective

range of the beacon and, as demonstrated by Captain Kerr's own inaccurate knowledge of the beacon, is a factor in an experienced navigator's decision whether to try to make contact. Positive information that the beacon operated continuously would provide an added incentive to attempt contact during the hours between midnight and 4:00 A.M. Absence of the revised list deprived the ship of the information which was available and which it needed to be reasonably equipped to carry out its services.

The Magistrate followed a correct conception of the applicable law in his analysis of the causation issue. The law under the Carriage of Goods by Sea Act is clear that if both an "excepted peril" under §4(2), 46 U.S.C. §1304(2) (1970), and unseaworthiness or another element described in §3(1), 46 U.S.C. §1303(1) (1970), concur in causing cargo damage, the shipowner is liable for the entire loss unless he can exonerate himself from part of the liability by showing that some portion is attributable solely to the "excepted peril." See J. Gerber & Co. v. S.S. Sabina Howaldt, 437 F.2d 580, 588 (2d Cir. 1971); Union Carbide & Carbon Corp. v. The Walter Raleigh, 109 F.Supp. 781, 791 (S.D.N.Y. 1951),

aff'd, 200 F.2d 908 (2d Cir. 1953). This familiar doctrine, given the basic events as the Magistrate reconstructed them, leads to the result he reached. There were concurring causes in the pertinent sense. While the court might be disposed to alter their characterizations - viewing the condition of unseaworthiness as the intervening "but for" cause -- this could not be of any use to the complaining shipowner.*

---

* Still more clearly unavailing was the shipowner's protests over the Magistrate's approving views, from personal experience, of loran. With characteristic thoroughness and candor, Magistrate Goettel reported his opinions, then made explicit and plain that the absence of loran played no material part in the decision. It is a long leap of psychoanalytic reasoning to argue that his thoughts about loran led to an overly strict "counsel of perfection" in finding a lack of due diligence because the shipowner delayed for over three months in supplying the important new radio list. Whether a contrary view of such leisurely handling might have been permissible, it would be more debatable than the one the Magistrate reached.

There remains the significant finding of which the court is driven to withhold approval. This is the finding that the crew, and quite particularly Second Officer Healy, would have consulted the up-to-date radio list and thus discovered the availability of the San Andres beacon. From the court's study of the record, the evidence appears to refute rather than support the finding that Second Officer Healy would have consulted the list. And if that is so, the record may not support the finding that any responsible officer at any material time would have done so. At least, the Magistrate's determination appears to hinge crucially upon the Second Officer and what he probably would have done.

In this setting, it may be of decisive significance that Second Officer Healy testified as follows:

"Q: Did it occur to you on your 12 noon to 1600 watch to look in the various publications you had aboard the ship for information about an aero beacon on San Andres Island?

"A: No, sir, it did not.

"Q: Did it occur to you to look for whatever information you had aboard the ship for an aero beacon on San Andres Island after midnight of that same day?

"A: No, sir, I did not.

"Q: Did you in fact look for it?

"A: I don't remember looking for it, no."

Granting the importance of the impressions of conscientiousness drawn by the Magistrate from observing Second Officer Healy, the quoted testimony would appear to cut considerable, very possibly crucial, ground from under the finding that the radio list would have been used.

Whether that finding (or a comparable finding as to what others of the ship's complement might have done or what Healy might have done in the way of studying a new list before the fateful night) might nevertheless stand is a question the court is not prepared finally to decide upon the cold record. It is prudent, rather, if not plainly compulsory, that the matter be remanded to the Magistrate for further proceedings consistent with the views expressed herein. There is no occasion, of course, for taking further evidence upon the remand. Counsel should be invited to make further submissions before the Magistrate as to whether, if at all, this interim opinion of this court should change the ultimate result. Those submissions may include demonstrations, if

available, that this court has misconceived the evidence or overlooked some vital portion of it. The eventual result may be a reaffirmed recommendation holding the shipowner liable or any other findings and conclusions the Magistrate deems warranted in all the circumstances. The findings and conclusions expressly approved in this opinion should stand without reexamination unless some compelling reason is shown why the single finding causing the remand requires reopening of other aspects (a course the court reserves as a theory but deems thin as a real possibility).

Upon the foregoing grounds, and for the narrow purpose stated, the case is remanded to the Magistrate for the ultimate rendering of a supplemental report.

So ordered.

Dated: New York, New York
March 4, 1975

Marvin E. Frankel
U.S.D.J.

SUPPLEMENTAL SPECIAL MASTER'S REPORT

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

1024a

----------x

AMERICAN SMELTING AND REFINING COMPANY, :

Plaintiff, :

-against- : SUPPLEMENTAL SPECIAL MASTERS REPORT

S. S. IRISH SPRUCE, her engines, tackle, etc., : 72 Civ. 656

-and against- :

IRISH SHIPPING LTD. :

Defendant. :

----------x

This case has been remanded for the issuance of a supplemental report on the limited question of whether the crew of the Irish Spruce, and in particular Second Officer Healy, would have consulted the 1971 radio list had it been aboard and thereby discovered the availability of the San Andres beacon. The court's doubts in this respect arose from testimony given by Healy that it did not occur to him, at the crucial time, to look in the ship's navigational publications for information about an aero beacon on San Andres Island. The court found that this testimony raised some question upon the finding that the new radio list would have been used had it been aboard.

In the context of the overall testimony, I did not (and still do not) arrive at such a conclusion. Healy had navigated through these waters before. He was familiar with the fact that the Swan Island beacon was in the old list and, indeed, had recorded in his own journal, (Ex. 52) during the prior trip, the call sign

is somewhat to the northeast of Swan Island. On the night in question, Healy turned on the radio direction finder and attempted to pick up the Swan Island signal which was the nearest radio direction beacon of which he was then aware. Consequently, the conclusion to be drawn from the testimony set forth in the memorandum opinion of the court is that it did not occur to the navigator to look in the old radio list since he was already completely familiar with its contents. He knew he would not find San Andres in it, nor any other station within 200 miles*

It is true that there is no direct evidence on the question of whether Healy, or other members of the crew, would have used the new light list had it been available. Since we are dealing with a question of what persons might have done, had the ship been differently equipped, there can be no direct evidence on the point. Pertinent testimony on the possibilities appears on pages 65 - 69 of the transcript. Acknowledging that he had not known about the San Andres beacon, Healy at first testified that he didn't think he would have used it had he known of it. The following cross examination then occurred:

Q "Going back to the radio beacon at Isla San Andres you say you didn't know there was a radio beacon there. But if you had known there was a radio beacon there and if you had known it had power of a thousand watts, and that it had continuous transmission, don't you think it is possible you would have used it then?"

A "It is possible, but I don't honestly know." (TM 66)

After then establishing that none of the other navigational aids were of use to the vessel at that time and in

*Another marginal station was Puerto Cabezos in Nicaragua, about 200 miles away. However, the 1969 list states it has "Services: By Day" while the new list reveals it by then had continuous service.

those waters, the cross-examination continued:

Q "It is true, isn't it, that you should use all the navigational aids that you can?"

A "It is."

Q "Is that what you normally do?"

A "Normally, yes."

Q "If you thought Isla San Andres would have been of help to you, you would have used it, I take it?"

A "I wasn't aware that a beacon existed there."

Q "But if you had been aware and thought it was good, you would have used it, would you?"

A "If I thought it was good, then I assume I would have used it." (TM 67-8)

The above answers are obviously somewhat equivocal.

At the very conclusion of the trial, Healy was recalled.

In response to questions from the court, he testified as follows:

Q "I take it when you first went on watch at midnight, you made an attempt to locate stations just by dial twisting and going around the dial, seeing if you picked up any signals, is that correct?"

A "I don't think so, your Honor, no."

Q "What did you do?"

A "As far as I recall, what I tried to get was to receive a signal from Swan Island."

Q "That was the only one you attempted to receive?"

A "That was the only one I attempted to receive."

Q "You did not attempt to receive San Andres because you were unaware of the fact there was a beacon there, is that correct?"

A "That's correct."

Q "Has it been your experience in operating a radio direction finder that if you know the approximate bearing of the signal you are looking for, it is more easy to find it than if you are merely making a sweep attempting to pick up any signals that happened to be in the area?"

A "It certainly helps if you have a general idea of where you expect the bearing will be." (TM 425-6)

As mentioned earlier, Healy had been along this course before. He had used the beacons on Swan Island and Grand Cayman and recorded the signals in his own journal. He turned on the radio direction finder to Swan Island when he came on duty and because he knew it was ther but he did not know of San Andres. When Healy came on watch, the Swan Island beacon was approximately 300 miles away and San Andres only 100 miles. He acknowledged in his deposition that if there was a beacon within range, it would have been of value. It follows that if he would try a station 300 miles away, he would certainly have tried one only one-third that distance.

As all parties acknowledged, Healy was an officer of "meticulosity in matters of navigation". (Carrier's Post Trial Brief P. 12) His personal journal (Ex. 52) contains a half dozen references to radio direction finder beacons. (February 8, March 7, July 17, July 26, September 1, October 1). From his prior performance, plus his testimony, it is apparent that he used radio beacons whenever they were available and necessary. On the prior voyage southward, he used Swan Island and Grand Cayman on October 1, but on October 2, despite overcast skies which prevented celestial sights, no attempt was made to use the RDF as they sailed south from the Quita Sueno and Roncador Bank passage. The obvious explanation for this is that they were out of Swan Island's range and did not know of the San Andres beacon. Indeed, both Healy and other ship's officer involved in taking navigational sights (Chief Officer Kelly), testified of their inability to find San Andres in the old radio list aboard, either in the index or the geographical listings.

The carrier argues that it is impermissable to draw inferences from such circumstantial evidence. It would be overly simplistic to conclude that, since a prudent navigator should have consulted a new light list to see if there had been additions for the area in which they were sailing, that this navigator would have done so. However, Mr. Healy had placed the order for this new radio list, he testified that he should and normally does use all available aids, and his journal establishes that he had done so in the past. It is not a matter of piling inference on inference as argued by the carrier, but simply whether he would, or would not, have used the San Andres beacon had he had adequate information in order to make use of it.

The carrier repeats certain arguments made in the objections to the report as to which no specific remand was made. It argues that, while hypothetical standards may be adequate to establish what constitute seaworthiness, they may not be used in order to satisfy the burden of proof of causation. Indeed, it points to the Marine Sulphur Queen, 460 F.2nd 89 (2d Cir. 1972), cert. denied 409 U.S. 982, as establishing a different standard of proof of causation of cargo claims from personal injury claims. There is no doubt that the burden of proof was on the cargo interests. It does not follow, however, that they must establish causation by direct evidence. Indeed, we are dealing with what the District Court has described as an intervening "but for" cause. There can be no direct evidence, and the trier of fact is compelled to resort to conclusions as to what would have occurred had the unseaworthy condition not existed.

It is true that the San Andres beacon is not as clearly listed in the 1971 Admiralty List of Radio Signals as it might have been. It geographically appears under Columbia, although it is closer to the coast of Nicaragua, and in the general index it appears only under the name of "Isla San Andres" not under "San Andres Island". It would, therefore, have been possible to have missed it in examining the new list. However, the entire format of the list of radio signals had been changed and other new stations added. It invited a careful review of the geographic section to determine the stations available.

If the San Andres beacon were known to the officers, and with the radio direction finder already turned on, it is hard to imagine, considering the qualifications of the officers aboard and the navigational situation then existing, that they would not have used the San Andres beacon. The evidence established that the beacon's capabilities were sufficient for purposes of making a rudimentary running fix, and would have provided an excellent danger bearing. Consequently, I adhere to my earlier findings.

Respectfully,

Gerard L. Goettel

Gerard L. Goettel
United States Magistrate

DATED: New York, N. Y.
May 8, 1975

NOTICE OF MOTION TO CONFORM

Filed May 13, 1975—Sprague & Rhodes

1030a

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint	:	
of	:	72 Civ. 3199 (MEF)
IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	:	
AMERICAN SMELTING AND REFINING COMPANY,	:	
Plaintiff,	:	
-against-	:	72 Civ. 656 (MEF)
S.S. IRISH SPRUCE, her engines, tackle, etc.,	:	
-and against-	:	
IRISH SHIPPING LTD.,	:	NOTICE OF MOTION
Defendants.	:	

S I R S :

PLEASE TAKE NOTICE That, pursuant to F.R.C.P. Rule 53(e)(2), the undersigned shall move this Court on May19, 1975, at 10:30 A.M., or as soon thereafter as counsel can be heard, in Room 2002, United States Courthouse, Foley Square, New York, New York, to adopt the Supplemental Special Master's Report filed by Magistrate Gerard L. Goettel on May 9, 1975.

Dated, New York, New York
May 13, 1975.

Yours, etc.,

BIGHAM ENGLAR JONES & HOUSTON
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HAIGHT, GARDNER, POOR & HAVENS
Attorneys for Compania Peruana de Vapores
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New York, New York 10004

OBJECTIONS TO SUPPLEMENTAL SPECIAL MASTER'S REPORT

10320

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- -x

In the Matter

of the

Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. IRISH SPRUCE, for exoneration from or limitation of liability.

72 Civ. 3199 MEF

- -x

AMERICAN SMELTING AND REFINING COMPANY,

Plaintiff,

-against-

S.S. IRISH SPRUCE, her engines, tackle, etc.,

72 Civ. 656 MEF

-and against-

IRISH SHIPPING, LTD.,

Defendants.

- -x

OBJECTIONS TO SUPPLEMENTAL REPORT OF SPECIAL MASTER

S I R S :

PLEASE TAKE NOTICE that IRISH SHIPPING LTD., Plaintiff in the first above-entitled action and Defendant and Claimant of the S.S. IRISH SPRUCE in the second above-entitled action, hereby objects to the Supplemental Report of United States Magistrate Gerard L. Goettel, Special Master, filed herein May 8,1975, in the following particulars:

1. The Supplemental Report misconceives the nature of the sole issue remanded to the Special Master under the Memorandum Decision of this Court dated March 4, 1975. In the original Report of the Special Master filed herein October

30, 1974, on the crucial issue of causation, the Special Master concluded as follows (p. 20): "Had he [Second Officer Healy] had the Revised List on board, I find that he would have examined it, determined the availability of the radio beacon, and used it."

In its Memorandum Decision of March 4,1975, the Court observed that "The evidence appears to refute rather than support the finding that Second Officer Healy would have consulted the list, and if that is so, the record may not support the finding that any responsible officer at any material time would have done so." The Court went on to say that "Granting the importance of the impressions of conscientiousness drawn by the Magistrate from observing Second Officer Healy, the quoted testimony would appear to cut considerable, very possibly crucial, ground from under the finding that the radio list would have been used."

After stating that the limited question on which the case was remanded was "whether the crew of the Irish Spruce, and in particular Second Officer Healy, would have consulted the 1971 radio list had it been aboard and thereby discovered the availability of the San Andres beacon", the Supplemental Report continues:

> "The court's doubts in this respect arose from testimony given by Healy that it did not occur to him, at the crucial time, to look in the ship's navigational publications for information about an aero beacon on San Andres Island. The court found that this testimony raised some question upon the finding that the new radio list would have been used had it been aboard."
>
> In the context of the overall testimony, I did not (and still do not) arrive at such a conclusion. ***"

It is not entirely clear to Owners to what "conclusion" the Supplemental Report was intended to refer. If it was meant to refer to "the finding that the new radio list would have been used had it been aboard", then, in stating that "I did not (and still do not) arrive at such a conclusion" the Magistrate has abandoned his original finding that the new radio list would have been used had it been on the vessel - the finding on which the ultimate finding of causation was based. If that finding has been abandoned, then Cargo has failed to meet its burden of proving causation, and Owners are therefore entitled to judgment.

The Supplemental Report states, at p. 2:

> "Consequently, the conclusion to be drawn from the testimony set forth in the memorandum opinion of the Court is that it did not occur to the navigator to look in the old radio list since he was already completely familiar with its contents. He knew he would not find San Andres in it, nor any other station within 200 miles."

If this was the conclusion to which reference was made on p. 1 of the Supplemental Report, then it is clearly erroneous and should be set aside.

There is no evidence whatsoever that the Master or officers of the IRISH SPRUCE consulted the list of radio signals that was on board that vessel, either in preparing for, or during the fatal voyage. Indeed, the evidence as recited in the Court's Memorandum Decision is all to the contrary, and the ultimate finding of fact of the Supplemental Report does not rise beyond the level of speculation.

2. Insofar as the findings of the Report are based on the premise that proof of conscientious prior performance of a

vessel's officers may suffice to meet Cargo's burden of establishing causation, the conclusions of the Report should be rejected as erroneous in law and contrary to the public policy in favor of good seamanship.

For the foregoing reasons, which are more fully set forth in the Memorandum of Law accompanying these objections, IRISH SHIPPING LTD., respectfully prays:

(1) That the motion of AMERICAN SMELTING AND REFINING COMPANY, et al., dated May 13, 1975 for confirmation of the Special Master's Supplemental Report be denied;

(2) That IRISH SHIPPING LTD.'s objections to the Supplemental Report be sustained;

(3) That judgment be entered, granting IRISH SHIPPING LTD. exoneration from liability and dismissing the complaint of AMERICAN SMELTING AND REFINING COMPANY, et al., with costs;

(4) That the Court grant such other and further relief as may be just and proper.

Dated: New York,N.Y.
May 21, 1975

Yours, etc.,

HEALY & BAILLIE

By: _____
Nicholas J. Healy
A Member of the Firm

Attorneys for Irish Shipping Ltd.
29 Broadway
New York, N.Y. 10006
943-3980

TO:

BIGHAM, ENGLAR, JONES & HOUSTON, Esqs.
Attorneys for Cargo Claimants Sprague
& Rhodes Commodity Corp., et al.
99 John Street
New York, N.Y. 10038

HAIGHT, GARDNER, POOR & HAVENS, Esqs.
Attorneys for Compania Peruana de Vapores
One State Street Plaza
New York, N.Y. 10004

DISTRICT COURT'S SUPPLEMENTAL MEMORANDUM and DECISION CONFORMING REPORT OF MAGISTRATE

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	72 Civ. 3199(MEF)
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, -against- S.S. IRISH SPRUCE, her engines, tackle, etc., -and against- IRISH SHIPPING LTD., Defendants.	72 Civ. 656(MEF) SUPPLEMENTAL MEMORANDUM

FRANKEL, D.J.

Following the remand ordered in the court's memorandum of March 4, 1975, Magistrate Goettel received further briefs and reconsidered the question of fact for which the case had been returned to him. In a Supplemental Report dated May 8, 1975, he states and

justifies his adherence to the ultimate finding of fact which the court deemed insufficient on the prior review. The parties have had and employed opportunities to seek confirmation or disapproval of the Supplemental Report. The court has reviewed the entire proceeding and these most recent presentations. It is concluded that the Supplemental Report is sound and should be sustained. It follows that the relief recommended in the original Report, dated October 15, 1974, will be granted.

Dealing effectively with the sharply defined problem entrusted to him by the remand, the Magistrate's further analysis of the record compels affirmance of the disputed finding. For the reasons he outlines, and upon the record documentation he notes, the Magistrate is now found to have been justified in finding that Second Officer Healy (probably along with one or more other officers) would have consulted and familiarized himself with the new radio list had it been aboard the ship and, based on the additional information contained in the up to date list, would have employed the San Andres beacon, only 100 miles off when he came on watch, rather than seeking in vain to use the much more distant Swan Island signal, which could not be reached because of static interference when Healy made his only attempt to receive the signal. In the

nature of the case, the determination had to be as to what course of conduct "would have been" the more probable in the circumstances. But this does not mean that the finding is either conjectural or infected with any misconceptions concerning the burden of proof. It is plain that the Magistrate had a correct view of the burden of proof and that he violated none of the rules or supposed rules limiting the drawing of inferences from evidence. It was not error, for example, to consider Healy's proved record of meticulousness, including his habits of learning and employing radio beacons and other aids, along with other evidence, in deciding what he probably would have done on the night in question had the new list been on the vessel before then. More broadly, the court finds persuasive - surely not clearly erroneous - the synthesis of the evidentiary materials given by the Magistrate in his resolution of this question.

Settle an interlocutory judgment as recommended by the Magistrate's Report and Supplemental Report.

Dated, New York, New York
June 16, 1975

Marvin E. Frankel
U.S.D.J.

INTERLOCUTORY JUDGMENT

USDC S.D.N.Y.
FILED
JULY 1 1975
S. DOHERTY

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff, as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	:	72 Civ. 3199 (MEF)
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, -against- S.S. IRISH SPRUCE, her engines, tackle, etc., -and against- IRISH SHIPPING LTD., Defendants.	:	72 Civ. 656 (MEF)
	:	INTERLOCUTORY JUDGMENT

This action came on for trial before the Court, and the issues having been duly tried and a decision having been duly rendered,

it is ORDERED AND ADJUDGED that the petition of Irish Shipping Ltd. for exoneration from or limitation of liability is denied; and

it is further ORDERED AND ADJUDGED that claimants, Sprague & Rhodes Commodities Corp., et al., recover their damages from Irish Shipping Ltd. and Compania Peruana de Vapores, with interest and costs; and

it is further ORDERED AND ADJUDGED that claimant, Compania Peruana de Vapores recover its damages from Irish Shipping Ltd., with interest and costs; and

it is further ORDERED AND ADJUDGED that the matter be referred to HON GERALD L. GOETTEL to ascertain and compute the amount of damages sustained, and report the same to this Court with all convenient speed.

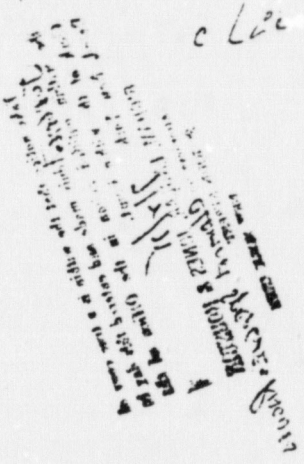
Dated, New York, New York
June 27, 1975.

P/ M.E.F.

U. S. D. J.

COPY RECEIVED
JUL 2 1975
HEALY & BALLLE

JUDGMENT Entered July 2 1975
Raymond F. Burghardt
CLERK



NOTICE OF APPEAL FILED BY IRISH SHIPPING LTD.

1041a

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

- -x

In the Matter of the Complaint

of

IRISH SHIPPING LTD., Plaintiff as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.

72 Civ. 3199 (MEF)

NOTICE OF APPEAL

- -x

AMERICAN SMELTING AND REFINING COMPANY,

Plaintiff,

-against-

S.S. IRISH SPRUCE, her engines, tackle, etc.,

-and against-

IRISH SHIPPING LTD.,

Defendants.

72 Civ. 656 (MEF)

- -x

S I R S :

NOTICE IS HEREBY GIVEN that Irish Shipping Co. Ltd., plaintiff in the first above-entitled action and defendant in the second above-entitled action hereby appeals to the United States Court of Appeals for the Second Circuit from each and every part of the interlocutory judgment of the United States District Court for the Southern District of New York, Honorable Marvin E. Frankel, entered in this consolidated action on the 2nd day of July, 1975.

Dated: New York, N.Y.
July 24, 1975.

Yours, etc.,

HEALY & BAILLIE

By: Allan A. Baillie

Allan A. Baillie
A Member of the Firm
Attorneys for Irish Shipping Ltd.
29 Broadway, New York, N.Y. 10006
943-3980

TO:

BIGHAM ENGLAR JONES & HOUSTON, Esqs.
Attorneys for Claimants,
Sprague & Rhodes Commodities Corp., et al.
99 John Street
New York, N.Y. 10038

HALLET, GARDNER, POOR & HAVENS, Esqs.
Attorneys for Compania Peruana
de Vapores, S.A.
One State Street Plaza
New York, N.Y. 10004

NOTICE OF APPEAL FILED BY COMPANIA PERUANA
de VAPORES

4105-9

1043a

filed
U.S. Dist. Court
July 29, 1975.
S.D. of N.Y.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In the Matter of the Complaint of IRISH SHIPPING LTD., Plaintiff as Owner of the S.S. "IRISH SPRUCE", for exoneration from or limitation of liability.	72 Civ. 3199 (MEF)
AMERICAN SMELTING AND REFINING COMPANY, Plaintiff, -against- S.S. IRISH SPRUCE, her engines, tackle, etc., -and against- IRISH SHIPPING LTD., Defendants.	NOTICE OF APPEAL file in 72 Civ. 656 (MEF)

S I R S:

NOTICE IS HEREBY GIVEN that Compania Peruana de Vapores, claimant in the first above-entitled action, hereby appeals to the United States Court of Appeals for the Second Circuit from that part of the interlocutory judgment of the United States District Court for the Southern District of New York, Honorable Marvin E. Frankel, entered in this consolidated action on the 2nd day of July, 1975 which ordered and adjudged that the cargo claimants, Sprague & Rhodes Commodities Corp., et al., recover their damages from claimant Compania Peruana de Vapores, with interest and costs.

Dated: New York, New York, July 28, 1975.

Yours, etc.,

HAIGHT, GARDNER, POOR & HAVENS

By _____
A Member of the Firm

Attorneys for Compania Peruana de Vapores
One State Street Plaza
New York, N. Y. 10004

TO: MESSRS. BIGHAM, ENGLAR,
JONES & HOUSTON
Attorneys for Cargo Claimants
Sprague & Rhodes Commodities Corp., et al.
99 John Street
New York, N. Y. 10038

MESSRS. HEALY & BAILLIE
Attorneys for Irish Shipping Ltd.
29 Broadway
New York, N. Y. 10006

Service of ~~three~~ two (2) copies of the within
is admitted this 20 day of OCT 19 75

/ Haight Gardner Poor Havens

2 COPIES RECEIVED
OCT 20 1975
Brigham, Engler, Jones & Houston